1-1-1999

The development, formative evaluation, diffusion, and usage of a health communication tool for noncommunicative patients

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THE DEVELOPMENT, FORMATIVE EVALUATION, DIFFUSION, AND USAGE OF A HEALTH COMMUNICATION TOOL FOR NONCOMMUNICATIVE PATIENTS

by

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DISSERTATION

Submitted to the Graduate School

of Wayne State University,

Detroit, Michigan

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

1999

MAJOR: INSTRUCTIONAL TECHNOLOGY

Approved by:

James L. Moseley 2.25.99

Adviser Date

Dedication

To the memory of my parents, my father Jacob Lichtman who died too soon, and my mother Helen Horenstein, who taught me the value of hard work.

And to the memory of Oscar Lanier Hunter, friend, intellectual mentor, and role model who always challenged me and who would have understood and been proud.

Acknowledgment

I extend my sincere gratitude to all of the individuals who have contributed, in various ways, to making this doctoral dissertation possible. To my family, my wife and children who often did not receive the attention they deserved, thank you for your patience and understanding in putting up with an increasingly absent husband and father.

To my dissertation committee, Dr. James L. Moseley, my advisor, and committee members Drs. Rita Richey, Alvin Edelson and Matthew Seeger, a special thank you for your support and advice over the years. I wish in particular to thank Dr. Moseley and Dr. Richey who over many years have been my instructors and have always been patient, helpful, and encouraging, even as the years passed on with increasing speed, and we all watched the clock.

I wish to thank the staff at William Beaumont Hospital who participated in all the stages of this study. In particular I wish to thank Barbara Kotal, MSN, RN,C, Director, Nursing Development and Educational Resources, who periodically gently reminded me to stay on task.

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CHAPTER I

STATEMENT OF THE PROBLEM

Communication Needs of Patients

Patients come into a hospital for various types of treatment. The nature of the treatment determines how long and under what conditions patients will stay in the hospital. The treatment and conditions also determine how well patients will be able to communicate with their health care staff and families.

In the hospital environment, many patients cannot communicate, either verbally, in writing or through sign gestures. They cannot communicate any of their needs, either medical, physical or emotional, to hospital staff or relatives. These noncommunicative patients can be found in all areas of the hospital: medical and surgical units, intensive care areas, rehabilitation settings and cardiology areas. Some noncommunicative patients may be in pediatric areas.

They cannot communicate for a variety of reasons. They may have special breathing or feeding tubes in their throats preventing them from speaking. They may have numerous tubes or monitors on their arms, making it difficult to write or point. They may have speech problems due to stroke or "closed head injury", the result of a violent blow to the head causing brain damage. They may also have hearing and vision problems, because of illness or age. They may be hearing impaired.

In addition to patients not being able to communicate with staff and families, the hospital staff and family members also cannot communicate their needs, questions and concerns to the patient. This lack of two-way communication can make it difficult for the medical staff to give high quality care. For example, if nurses wish to know if and where patients have pain, or what patients' needs are, they may not be able to get an answer.

Patient populations with communication problems fall into several categories:

1. Non-English speaking patients;

2. Patients in Critical Care Units (CCU), also called Intensive Care Units (ICU's), or Acute Care Areas; (There are a wide variety of patients with communication problems in these areas, patients on ventilators, stroke patients and others.)

3. Patients in Rehabilitation areas; (These patients may have "closed head" injuries or be stroke patients. Areas where they may be found include Rehabilitation Nursing, Speech Pathology, Physical Therapy, Recreational Therapy, and Occupational Therapy.)

4. Deaf or hearing-impaired patients.

These patients can be found in all areas of the hospital. Patients also move from area to area. Patients may go from a Surgical Intensive Care unit to Medical Intensive Care, then to a Rehabilitation area, and through that process, continue to have communication problems.

Communication Problems in the Health Care Environment

At William Beaumont Hospital, Royal Oak, a suburb of Detroit Michigan, there was a perception that we were not meeting the communication needs of certain patient populations, in particular, the non-English speaking population, the great majority of whom were from Arabic background. These patients, on the whole, did not speak, or spoke very little English, had different cultural values and characteristics which made communication with female staff difficult and had differing views on death and dying issues. On a basic level, these patients had physical needs that could not be met because of the language barrier. In addition, the language barrier made it difficult for the health care staff to provide the best possible patient care because questions and issues were never clearly addressed, stated or answered.

Needs Assessment of Nursing Staff Who Care for Non-Communicative Patients

A needs assessment can be powerful tool for identifying what is working and what is not. What results are we now getting compared to those we should have? Needs assessments provide a process for defining the gaps between current and desired results. A need is the gap between "what is " and "what should be." (Kaufman, 1992).

Given the perceived unmet communication needs of patients, particularly the non-English speaking patients, as well as the communication needs of staff who cared for these patients, as far back as 1987, the Nursing Department of William Beaumont Hospital decided to investigate the situation. A Survey was designed and the result was the establishment of a "Language Task Force" to identify specific needs and possible solutions. The Task Force felt that a basic visual communication tool was needed, a "Beaumont Communication Tool," to meet the physical and emotional needs of the patients, as well as the needs of families and nursing staff. A fuller history and analysis of the development of the Communication Tool are presented in Chapter III.

Questions Raised by the Need for a Communication Tool.

From the beginning, a number of questions arose as to the nature, scope, and limitations of the Communication Tool:

1. Who was the audience: patients, families, staff? Should there be separate tools developed for the different groups, patients, family members, staff ? Should there be a tool for children? What would be the differences between the tools? Would the differences be in content, in format?

2. What should be the content of this tool? What kinds of objects, text, items, activities, feelings or other areas should be covered?

3. How much should be visual and how much verbal? In what type of organization, structure or design?

4. Was there a particular sequence that should be followed for the text messages? For the graphics?

5. How large should the visuals be, given the elderly population with low vision? How large the text, the graphics? Should there be captions under the graphics?

6. Was there a preferred format, either portrait or landscape, large scale or standard page size, that would be more appropriate, given the needs and audience.

7. Should all English text be translated into Arabic?

8. How should this tool be cost-effective? A spiral binding is utilitarian and attractive, but labor intensive, with each binding installed individually and manually.

9. How do we design an effective, inexpensive educational product that can be printed in large quantities and be given to patients free of charge?

Need for Systematic Approach to Communication Tool Development

As questions were raised and the project became more complicated, the need arose for a systematic approach to the development of the communication tool. While there was no single model, either a communication model or a systems model, that was utilized, the systems approach, or a systematic problem-solving approach was utilized from the outset.

There are numerous models, whether they are called Instructional Design, Instructional Development or Instructional Systems Design models, that reflect the steps taken during the development of the Beaumont Communication Tool. By 1980, Andrews and Goodson (1980) had identified 60 such models. Dick and Carey (1996), the Interservice Procedures for Instructional Systems Development (IPISD) model (1987), Seels and Glasgow (1990) all have elements that can be used in educational product or systems development. Gustafson (1991) called these Instructional Development Models. Most of the models are variations on the basic components of Analysis, Design, Development, Implementation and Evaluation. These traditional steps or phases were followed in the development of the communication product. There was an initial

assessment of needs, the design of the product, the actual development, and the pilot testing phase with feedback. Throughout, a formative evaluation process took place as the product was being developed.

Sequence of Steps Needed to Develop a Communication Tool for a Health Care Setting.

To develop a communication tool, specific steps are needed. These steps are sequenced to assure that all instructional design concepts have been addressed. These steps include:

1. Identify Subject Matter Experts (SME's) in Intensive Care Units, Rehabilitation, including Speech, Physical Therapy, Occupational Therapy, "Closed Head" Injuries and stroke patients staff, to develop needs assessment regarding their patient populations. Clinical Nurse Specialists or other educators make good SME's because they tend to know a variety of patients and their needs.

2. Design instruments based on SME inputs. Questionnaires will survey the staff regarding what they see as a communication need in their patient population. Mail out surveys and interview staff. Survey responses and interviews lead to communication tool development and refinement over a period of several years.

3. Develop the communication tool or tools in both verbal and visual format, in foreign language if needed.

4. Pilot-test, field test the tool (part of formative evaluation) with selected staff.

5. Continue to revise communication tool based on feedback from different areas of the hospital.

Objectives of Communication Tool

Three types of objectives were identified for the three populations using the tool: the patient, family member and staff.

1. Using the completed communication tool, patients will be able to:

   - communicate their needs, both physical and emotional, to family members and hospital staff

   - communicate using written verbal statements pertaining to their physical and emotional needs, environments, activities.

2. Using the completed communication tool, family members will be able to:

   - communicate with their loved ones regarding the patients' needs, both physical and emotional

   - use the verbal and visual sections of the tool to communicate re the patients' environment and activities.

3. Using the completed communication tool, hospital staff will be able to:

   - communicate with patients regarding information the staff needs in order to provide the best medical care for the patients.

Formative Evaluation of Communication Tool

Formative evaluation has long been an important component in the Instructional Design process. Scriven (1967), first identified the different roles played by formative and summative evaluations. Numerous other educators and practitioners have contributed to the development of the Formative Evaluation literature (Komoski & Woodward, 1985, Worthen & Sanders, 1987, Flagg, 1990, Dick and Carey, 1996, Tessmer, 1993).

According to Scriven (1967), each step should result in immediate feedback to the developers, who would then use the information to make necessary revisions (p.17). The use of formative evaluation gives the developer a chance to examine the effectiveness of the product as it is being developed, in the process of development.

Formative evaluations have been performed on ongoing basis with the Communication Tool being refined based on the feedback of nursing staff. The feedback has come in the form of surveys being returned, old communication tools being returned with revisions, additions, deletions, and informal discussions and telephone conversations.

The tool has been pilot tested throughout the hospital, focusing on patient care areas, including both medical and surgical nursing areas and Rehabilitation areas such as

Speech Pathology, Physical Therapy and Occupational Therapy. The tool has been used with stroke patients and patients on Respiratory Therapy.

Surveys have been included in nursing newsletters. The original and simpler version of the communication tool, along with surveys, were passed out through the various area and hospital wide Education and Research Committees and task forces. Clinical Nurse Educators, diabetes educators, dietitians and other individuals who did specialized patient teaching were given the surveys and the tool it its initial simple format. The nursing newsletter, Partners in Excellence, featured articles and the survey. Numerous telephone discussions took place, trying to identify the types of patient communication needs for a particular area. Informal focus groups were established by these individuals who, when taken together, represented all the individuals in the hospital who had formal education background, did in-depth patient teaching on the units, and who taught nurses how to teach patients. Survey responses and interviews lead to communication tool development and refinement over a period of several years.

Based on these results, a number of conclusions were drawn that led to further development of the tool.

1. Identify communication needs in two areas: the physical needs and the emotional needs. In the area of physical needs, investigate the physical care of the patient, needs dealing with medical and pragmatic concerns. The second type of communication needs identified are those needs dealing with the affective life of the patient, the emotional life. Meeting those needs will encourage the expression of thoughts and feelings in the patient's life while they are in the hospital.

2. Need many more text categories and statements, dealing with specific issues such as pain and medication, personal feelings, specific requests from patients unable to speak or move.

Guidelines for Using the Communication Tool

Guidelines have been developed for both users: the staff member and the family

member or visitor. These guidelines will be written into the tool or discussed personally with the staff or family member by the researcher or a knowledgeable staff person.

Diffusion of Communication Tool

Much research has been accumulated on the subject of "diffusion." The term has been defined as the process by which an innovation is communicated through certain channels, over time, among the members of a social system (Rogers, 1994).

Diffusion of the Communication Tool became an issue not long after the initial distribution of the first version, but particularly in the past year, there has been a substantial decrease in the demand for the Tool. Some staffs have stated that the tool was not being used, but they did not know why. Upon some on site investigation, it was observed that some tools were stored in the back of file cabinets, or the units had run out and not reordered. The problem of diffusion of an educational product in a large health care environment will be one component addressed in this study.

Usage of Communication Tool

While much has been written about usage of media, particularly the use of audio-visuals, the usage or utilization of an educational product was not addressed in the research literature until relatively recently (Seels & Richey, 1994). It is one thing to develop an educational product based on a needs assessment and following an ISD approach; it is another thing to have this product used by the individuals who supposedly have the need for such a product. Why people use or do not use a product developed to meet their needs is a question that will also be addressed in this study.

Physical Creation and Production of Communication Tool

Based on the information gathered through needs assessments, surveys, feedback, revisions, the researcher created all the visuals called for as well as the text portions and

the fill-in forms to make the tool easily individualized by the patient. Fill-in forms include such information as important names, phone numbers, medications being taken, next doctors appointments, etc. The researcher selected the format, scale, size, binding, paper and quantities to be printed, so as to make the product the most cost-effective. The Communication Tool has been produced, reprinted several times and is in the process of being translated into Arabic and Gutjari, an East Indian language. The Beaumont Communication Tool has been copyrighted. It was designed to be inexpensive, easily reproduced and individualized to meet the user's needs. It is distributed free of charge to patients, families and staff.

Purpose of the Study

Following initial development of the communication tool, it was distributed to selected departments for formative evaluation. This evaluation included review of the content by the SMEs and actual pilot testing by staff members working with nonverbal patients. Feedback was obtained that was generally positive. Revisions, additions, deletions, and other changes were made based on suggestions and feedback from the SMEs and staff members. The revised communication tool was made available to wide population of users. Staff members were made aware of the availability of the Communication Tool and how it could be obtained.

After initial distribution of the Communication Tool, requests decreased for this tool, with an assumed decrease in usage by staff members. Since this tool was developed primarily from requests for a communication devise for working with nonverbal patients, it was assumed that usage would remain high. There is a need to investigate the diffusion process that was used to distribute the Communication Tool in a large health care

organization and determine reasons why staff members have ceased to use this aid.

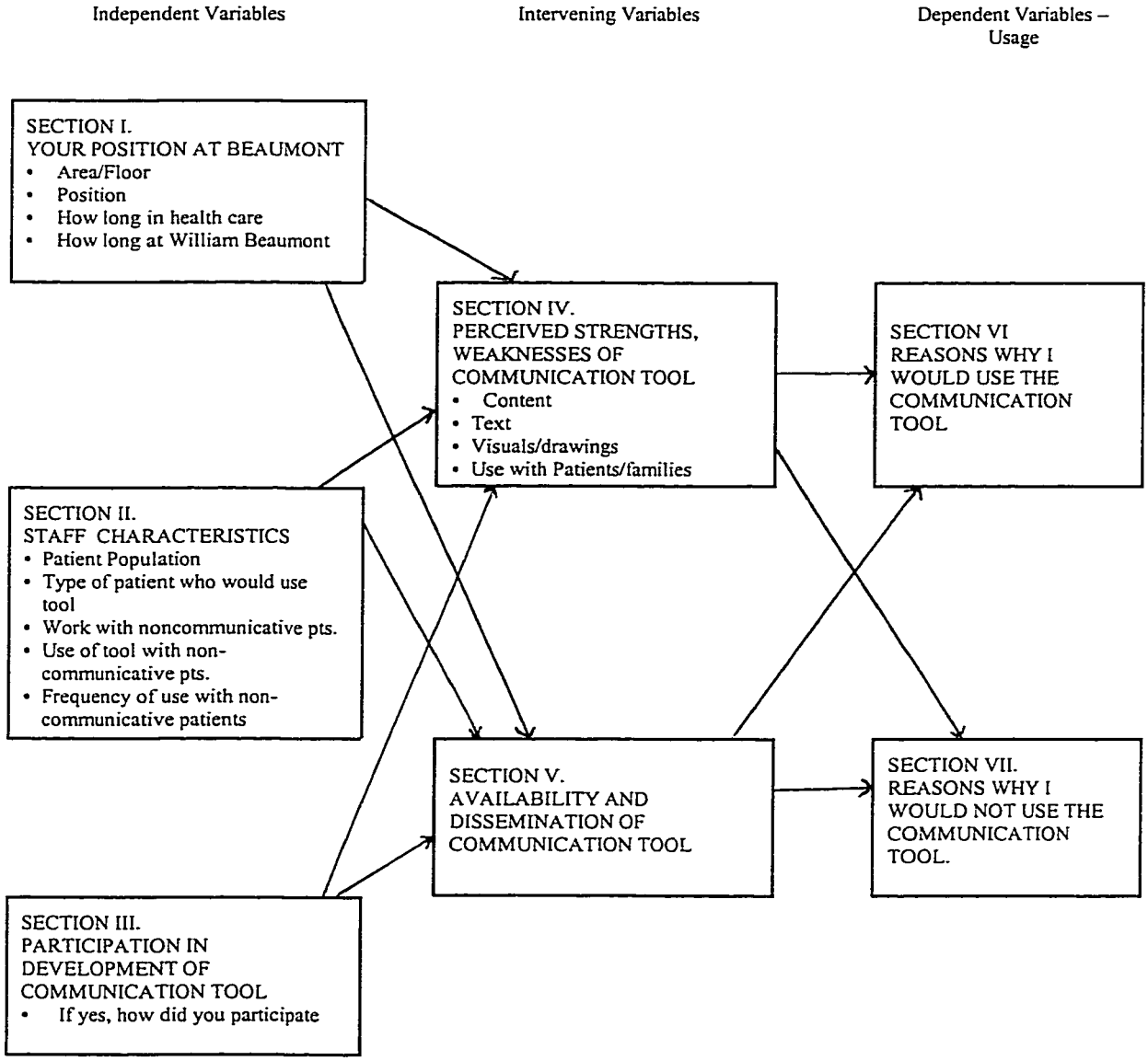
This study examined the usage (diffusion) of the communication tool, as part of a formative evaluation, to determine who is using the communication tool, perceptions of strengths and weaknesses of the communication tool, and perceptions of the effectiveness of the communication tool in facilitating communications with nonverbal patients.

Model of the Study

A model has been developed which provides the schematic of the relationships between the variables included in this study. Figure 1 presents this model.

Figure 1

Model of Beaumont Communication Tool Usage



Research Questions

The following research questions were addressed by this study:

1. Is there a relationship between staff characteristics such as unit, nature of patients, position on staff, experience with noncommunicative patients, and the staff's use of the communication tool (diffusion)?

2. Is there a relationship between the staff's early participation in the

development and design of the communication tool, and the staff's use of the tool?

3. Is there a relationship between perceived strengths and weaknesses of the communication tool, and the use of the tool ?

4. Is there a relationship between the perceived effectiveness of the communication tool with patients and families, and its use by the staff?

5. Can the usage of the communication tool be predicted from staff characteristics, participation in early design, perceived strength and weaknesses, and perceived effectiveness?

Significance of Study

This study is important since it can identify why an educational product that at one time was felt to be important for staff and family communication is or is not being utilized on the units. Knowing these answers is part of the formative evaluation process and may contribute to the improvement of the communication tool, and its diffusion throughout the health care institution.

Definitions

The following terms have been defined for use in this study:

Cardiac Care Unit (CCU): A specially equipped unit staffed with professionals having extensive education and experience in the treatment and care of patients with cardiac or heart disease.

Closed Head Injury: An injury caused by the collision of the head with another hard surface. This injury can produce impairment of cognitive abilities and physical functioning, as well as behavioral or emotional problems. Impairments may be temporary or permanent. (For the purposes of this study, closed head injury will be used interchangeably with Traumatic Brain Injury (TBI)).

Intensive Care Unit (ICU): A specially equipped unit staffed with professionals having extensive education and experience in the

	treatment and care of patients with life threatening conditions. There are medical (MICU) and surgical ICU's (SICU).
Noncommunicative Patient:	A patient who is unable to speak as a result of accident or physical injury, or is unable to communicate because his/her primary language is not English.
Physical Therapist:	A professional who evaluates and treats the Head Injured patient for neuromuscular deficits to maximize the patient's return to functional activities.
Respiratory Therapist (RT):	A health care professional who cares for patients with lung problems or receiving oxygen therapy.
Speech Language Pathologist:	A professional who evaluates and treats disorders of comprehension, reading, memory, orientation, oral-motor functioning, writing and cognition which may be present following a closed head injury.
Stroke:	The technical term for stroke is "cerebral vascular accident" or CVA. This means that either the blood supply to part of the brain is shut off, or there is bleeding within the brain. The result is a brain "injury."
Tracheostomy:	A surgical opening in the trachea through which is a respirator is attached for long term breathing assistance.
Ventilator/Respirator:	A machine used to breathe for a patient when he/she cannot.
Visual Communication:	Using visual symbols to express ideas and convey meaning.
Visual Literacy:	The ability to understand, and use images, including the ability to think, learn, and express oneself in terms of images.

Limitations

This study took place in one hospital. While the results of this study may not be generalizable to other hospitals, administrators and medical personnel may find the

results useful in developing and using communication tools with their patients and families where the patient is not able to communicate orally.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

This review of the literature focuses on two major areas: the literature from nursing research focusing on nurse-patient/patient-nurse communication, and the literature from research and knowledge bases. Nursing research literature includes studies from specific patient populations and areas such as critical and intensive care, strokes and closed head injury areas, and rehabilitation units. Literature from research and knowledge bases includes studies on Systems theory, communication theory and models, Visual Literacy, Formative Evaluation, Diffusion and Utilization.

Communication in the Health Care Setting

Communication in a hospital setting is an essential component of the health care process. When patients cannot communicate with health care professionals and family members; their recovery process may be affected. The effects of these limitations are discussed in this section.

The Inability to Communicate

Research has established that for many patients, the inability to communicate effectively, either by speaking or because of other limitations, is one of the most stressful part of the hospital stay (Dowden, Beukelman & Lossing, 1986; Fried-Oken, Howard & Stewart, 1991; Menzel, 1994). Researchers have also found that anger, anxiety, fear, insecurity, and the inability to sleep may also be associated with being unable to communicate. Improved communication lessens anxiety which in turn may improve patient care, length of stay in the hospital and compliance (Bergbom-Engberg &

Haljamae, 1988; Fitch, 1989; Johnson & Sexton, 1990).

Communication: Definitions

Communication has been defined as "any information related behavior" (Ruben, 1984). Edgar Dale (1969) defined communication as "the sharing of ideas and feelings in a mood of mutuality." Theodorson and Theodorson (1969) said it was "the transmission of information, ideas or attitudes from one person or group to another primarily through symbols." Berelson and Steiner (1964) saw communication as "an act or process of transmission of information, emotions, skills etc., by the use of words or language."

Northouse and Northouse (1992) defined communication as "a process of sharing information according to a common set of rules." They defined human communication as "information shared between individuals using a common system of symbols and language," and health communication as "health-related transactions between individuals who are attempting to maintain health and avoid illness" (p. 19).

Physical and Emotional Needs of Patients

Research has shown that investigation of patients' communication needs should occur in two areas: physical needs and emotional needs (Ashworth, 1985; Byrne &Heyman, 1997; Macleod-Clark, 1985, 1988; Fielding, 1982; Lyall, 1990; Menzel, 1994). Physical needs include the daily physical care of the patient, including medical care and other needs dealing with pragmatic concerns.

The second type of communication needs, more complicated and often overlooked by the nursing staff, are those needs dealing with the affective life of the patient; the emotional life of patients and their families. Because these emotional needs are not seen as "life and death" issues, they are relegated to a secondary position and often not investigated by the staff. Research shows that nursing staff must begin to

identify and respond to those patient needs that are expressions of thoughts and feelings in patients' lives while they are in the hospital (Caris-Verhallen, Kerstra & Bensing, 1997).

Research on Communication in Critical Care Areas

While there are many areas in the hospital environment where more research on the responses of critically ill patients could occur, the area of critical care in particular has received little interest from researchers. The few critical care related topics that have been studied have mainly focused on medication and nursing care issues.

One important topic that remains under-researched concerns the communication between patient, family and nursing staff during the patient's stay in the critical care areas. This paucity of research continues in spite of the strong leadership provided by the American Association of Critical-Care Nurses (AACN) during the past 20 years (Menzel, 1994).

In 1983, the AACN identified research priorities in critical care. One of these priorities was communication during mechanical ventilation (Lewandowski & Kositsky, 1983). Despite this sense of urgency, little research has been published. For example, in the past 20 years, fewer than 20 articles were located on communication and ventilated patients (Dossey, Guzzetta & Kenner, 1992; Menzel, 1994; Van Coot, Tittle, Moody & Wilson, 1991). These studies covered three communication-related areas: a) patient's responses to inability to speak; b) the use, efficacy, and feasibility of communication methods, and c) the communication process between nurses and the ventilated patients in the critical care environment (Menzel, 1994).

Communication and Stress

Research has shown that patients who have experienced mechanical ventilation

during their hospital stay have consistently stated that the inability to communicate verbally, by speaking, is one of the most stressful aspect of their intensive care stay (Bergbom-Engberg & Haljamae, 1989; Fitch, 1989).

Stress from the inability to speak is often combined with other fears and negative emotions: anger, anxiety, insecurity, and the inability to sleep (Johnson & Sexton, 1990; Riggio, Singer, Hartman, & Sneider, 1982; Stovsky, Rudy, & Dragonnette, 1988). Fitch (1989) and Jones, Hoggart, Withey, Donaghue, and Ellis (1979) suggested there could be a possible relationship between emotional responses and other variables, such as the amount of time ventilated. Riggio, et al. suggested a link between these emotions and the amount of difficulty experienced with communication.

Patients in the Intensive Care Units: Mechanically Ventilated Patients

If the nature of the treatment is surgical, the patient can expect to be in the hospital between three days and as long as three months. During much of that period and for a variety of reasons, the patient may have no means to communicate with a health care worker or family members.

The reasons the patient may not be able to communicate are related to the particular types of medical or surgical procedures. For example, any surgery that demands the patient have a trach tube inserted into the throat means the patient cannot use his vocal cords and speak. Usually these patients are restrained, either physically tied down or medically sedated or both. This is done so they do not injure themselves and for the surgical area to heal. These restrained patients usually cannot speak and cannot move.

Patients on mechanical ventilators have the most problems. These patients are not able to breathe on their own and are attached to a machine, the ventilator, that breathes

for them. Part of the ventilator is a tube inserted into the patient's throat, preventing speech.

Patients in the critical care areas may also have numerous tubes or "lines," inserted into their arms for liquid medications, also preventing movement, and writing. These patients have no means by which they can communicate their needs (Connolly & Shekleton, 1991; Salyer & Stuart, 1985: Williams, 1992).

Communication Between Nurses and Patients on Ventilators

Several studies have examined communication and interaction between ventilated patients and nurses in critical care settings (Ashworth, 1980; Gries & Fernsler (1988); Salyer & Stuart, 1985). The studies verified that ventilated patients limit their communication and that the majority of interactions were initiated by nurses. In both cases, nurse-initiated and patient-initiated, the interactions were very brief, limited to essential information.

Nurse-initiated discussions were, according to Ashworth (1985), "short-term informative," for the purpose of telling the patient what the nurses were going to do. Communication dealt with pragmatic concerns and physical care, rather than encouraging the expression of patients' thoughts and feelings. Very little communication was devoted to the reorientation of the patient or discussion of patients' home life, personal interests, or other factors related to life outside of the hospital.

The majority of communication methods used by patients were patient-initiated (Ashworth, 1984), or methods that the patient could use without assistance, such as gestures or mouthing words. Nurses in this study were aware of alternative communication methods such as writing or using an alphabet or communication board for patients who could move but not speak; however, they never used these methods. Instead,

they relied on patients' gestures and attempts to mouth words.

Findings from these studies support the findings of Gries and Fernsler (1988) that ventilated patients also restrict their communication to essential information, pragmatic concerns and physical care.

Patients in the Rehabilitation Areas: Stroke and Traumatic Brain Injuries

The stroke patient. In the United States, over one half million people suffer a stroke each year, and about 3 million Americans are currently living with varying degrees of disability from strokes. Most stroke patients are initially treated in a stroke unit or an acute care hospital where they receive rehabilitation services.

When the patient is medically stable, screening for rehabilitation is performed. Stroke survivors who recover completely will not need rehabilitation, but the majority will have functional deficits and will be candidates for rehabilitation services (Ashworth, 1984).

Communication disorders occur in as many as 40% of stroke patients. Stroke patients have particular communication needs. One of the areas that is impacted when a stroke occurs is an area in the brain that controls speech. Patients initially may have great difficulties speaking, but with ongoing speech and physical therapy, these patients can recover much of their speech.

The Traumatic Brain Injured (TBI) patients. The Traumatic Brain Injured patient, also called closed head injured patient, may have the same characteristics as the stroke patient. In these patients there has been injury to the brain and they have limited cognitive capabilities. They may have speech problems preventing them from speaking clearly and they may have brain damage resulting in difficulties with vision and perception. They can

become easily confused with verbal or visual information.

One complication in communication in the rehabilitation areas concerns the amount of damage that has been done to the brain as a whole. It is often not clear if there is a speech problem alone, or a problem of a cognitive nature, in the patient.

The rehabilitation areas where stroke patients learn to walk and talk again include Speech and Language Pathology, Physical Therapy, Occupational Therapy. In these areas, patients have various degrees of physiological damage which prevent them from communicating clearly.

Communication disorders include:

1. *Aphasia*. This is a disorder of language comprehension, retrieval and formulation.

2. *Right hemisphere communication disorders*. These disorders include a variety of difficulties in organizing and using language.

3. *Dysarthria and apraxia of speech*. These are disorders that impede production of intelligible speech.

Communication in the Rehabilitation Areas

While the patient in the critical care area is cognitively sound, with no damage to brain function, the patient in the rehabilitation area, whether stroke or closed head injured patient, has had brain trauma. The extent of the brain damage has not been determined. What is known is that the damage, whatever the extent, has impacted memory, perception and speech in the patient. The patient in the rehabilitation area must now begin to relearn to not only eat and walk, but also to see and talk, to help his brain as it heals, to make these connections that will make the world understandable once again. During these early days after the stroke or the head injury, the patient has difficulties comprehending the symbols we call letters and words, as well as saying and understanding these we call

words, sounds. Communication between patient and staff, becomes the key element, or link, that will allow the patient to move forward, so that the patient can relearn more quickly.

In all aspects of the rehabilitation process, patients and family members are encouraged to participate from the very beginning of the process. They are encouraged to be an active participant in the interdisciplinary team that will guide the progress of the patient.

Augmentative and Alternative Communication (AAC) Methods

Researchers have for some time explored the feasibility of various communication methods for those patients unable to communicate verbally or in writing. The main purpose of non-traditional communication techniques in the intensive care units (ICUs), sometimes called "expressive communication augmentation" or "Augmentative and alternative communication," is to provide the patient with a means to express basic physical needs or vital information. In addition, there is a need to increase the amount of interactions between patient, ICU staff and family members in order to reduce the patient's isolation and fear (Lawless, 1975; Mast, 1986).

Augmentative and alternative communication (AAC) methods are developed by the patient and family, others by speech pathologists or nursing staff. Techniques included a yes/no system with either a head shake, thumbs up or down, eye movements or eye gaze system. Other techniques include lip reading, facial expressions and mouthing of words. Hand or foot movement may be used to activate a switch or to form manual messages (signs, gestures, or letters) written on a hand.

Hi-tech electronic devices include various types of computers, such as electronic scanning devices, or phrase boards (Fried-Oken, Howard & Stewart, 1991). The

computer, "talking" endotracheal and tracheostomy tubes, and the electrolarynx, have also been used to facilitate communication.

Low tech devices include alphabet boards or Magic Slate boards. The alphabet board provides more flexibility if patients are cognitively aware and have the strength and endurance to "point out" longer messages.

Patients Who Require AAC Methods

Patients in the intensive care units may require these methods for short periods of time. While patients are initially highly medicated and too ill to communicate, once the illness is controlled they are cognitively and language wise functional, but they may experience short term severe expressive disabilities. They are temporarily unable to speak and need means to express basic needs until their speaking abilities are restored.

Dowden, Beukelman and Lossing (1986) found that most patients fell into four etiology groups: cardiopulmonary insufficiency, spinal cord injury, degenerative diseases, and closed head injuries. They concluded that most nonspeaking patients in ICUs require multiple simultaneous approaches to meet their communication needs, and that these approaches change with the patient's resolving cognitive status and oral motor skills.

Some injuries and illness, such as closed head injuries, spinal cord injuries, and postoperative conditions that require intubation, tracheostomy, or mandibular wiring may interfere with natural speech. Other severe expressive disabilities, resulting from neurologic disease, traumatic injury, musculoskeletal disorders, or the introduction of life saving equipment, may also prevent natural speech. Many diseases produce temporary speechlessness in adults including Guillain-Barre syndrome, botulism, and cardiopulmonary insufficiency (Vanderheiden & Yoder, 1986).

AAC approaches offer patients a way to express themselves throughout the illness

until motor skills return. AAC specialists are beginning to describe interventions for the temporary nonspeaking adult in the ICU. Dowden, Honsinger and Beukelman (1986) developed a systematic means to evaluate and select AAC systems for adults in the acute care setting. In their study, Fried-Oken et al. (1991) reported satisfaction with these techniques, defined as "repeated use by patients," and reported success in aided expression, in about 85% of the interventions (p.15).

Issues in Patient-Nurse and Nurse- Patient Communication

A variety of factors and issues have historically combined to make the topic of patient-nurse and nurse-patient communication an important research area within nursing. While there is a large body of literature that emphasizes the importance of communication in caring for patients (Ashworth, 1985; Bergbom-Engberg & Haljamae, 1988; Dowden, Beukelman & Lossing, 1986; Lyall, 1990; Macleod-Clark, 1988; Menzel, 1997; Sundeen, et al. 1989), much of the literature on nurse-patient communication has been critical of the quality and quantity of nurse-patient communication.

It is difficult to discuss nurse-patient, or patient-nurse communication in isolation, outside the broader environmental, organizational and social context. The issue of communication is comprised of interrelated sub-issues including:

- communication skills of the health care worker;
- volume of work and pressure of conflicting demands;
- time the nurse has to accomplish all her/his tasks;
- primary attention placed on physical care (accomplished in a minimum of time), often neglecting the emotional care;
- avoidance techniques used to ignore a patient; and
- stressful environment of today's health care setting.

Quality and Quantity in Nurse-Patient Communication

Kratz (1984), Lyall (1990), and Macleod-Clark (1983) studied the quality and quantity of nurses' communication with patients. Conversations were generally described as friendly, but stereotyped; superficial; short in duration; and controlled and manipulated by nurses who tended to initiate communication, restrict the course and topics of conversations, and end communication when they chose. Patients have described the communication as one-way, from nurse to patient.

Communication also tended to occur during the physical care of the patient, with conversations focused on physical care issues, nursing instructions, and explanations of procedures. Rarely did discussions involve issues of feelings, or personal issues such as families or emotional needs. The nurses' objective or intention during interaction with patients was mainly concerned with completing the nursing task being undertaken (Fielding, 1982).

Information from Nurses

Early research that assessed patients' perceptions of their health care consistently identified poor patient-staff communication and the lack of information patients and families received as a major complaint (Cartwright, 1964; McGhee, 1961). Health professionals have also shown concern over what patients should be told and who should tell them, sometimes leading to a conscious withholding of information (Laurent, 1991).

Benefits of Patients Having Information

Research has shown the beneficial effects of giving information and educational materials to patients. These benefits have included reduction in pain and anxiety, a reduction in the quantity of pain medication used, in the number of times the nurse gets "calls" from the patient room, a shortened hospital stay, and fewer returned visits to the

hospital (Eddy & Coslow, 1991; Haywood, 1975). In addition, the emphasis on health promotion and the compliance of patients in the drug and treatment regimes requires patients to understand and remember the information they receive. So not only does the information have to be communicated to patients, but it must be communicated clearly, easily understood and remembered (Ley, 1988).

Importance of Interviewing Skills

The nursing process required good interviewing skills to enable accurate problem identification to aid planning, implementation, and evaluation of care (Audit Commission, 1992). Research on the medical profession has shown that communication and interviewing skills were poor but that they could improved (Maguire, Fairbairn & Fletcher, 1986).

Improving Communication Skills of Nurses through Training

Communicating with patients has been identified by nurses as a difficult and stressful aspect of nursing, and many nurses feel they have communication training needs. Communication skills training for nurses have long been advocated, and in many areas, have been implemented. Much of the literature continues to call for improvement of communication skills, through training, of nurses and other health professionals (Dickson, Hargie, & Morrow, 1989; Faulkner, 1993; Porritt, 1984; Kagan, 1985). The process of communication skills training for nurses has been described and positive outcomes indicated (Crute, Hargie & Ellis, 1989; Faulkner, 1992; Lloyd, 1991; Tomlinson, Macleod-Clark & Faulkner, 1984). Davies (1992) described changes in communication skills as learners [nurses] progress through their training program. Fallowfield (1993) described how training has become part of basic and post-basic nurse education .

Communication Needs of a Varied Patient Population

Many studies have focused upon particular patient groups identified as having specific communication needs. These include patients with endotracheal tubes (Ashworth 1980, 1985); surgical patients (Macleod-Clark, 1983); mentally ill (Hunt, 1991); the elderly (Davies, 1992; Engram,1981; Gibb & O'Brien, 1990); and cancer patients (Faulkner, 1992; Lanceley, 1992; Wilkinson,1991).

Certain patient groups, such as people with cancer, are believed to cause more difficulty for nurses that others (Wilkinson, 1991). Communicating with cancer patients in different disease stages, such as newly diagnosed or terminally ill, were the most frequently requested areas of more knowledge (Corner & Wilson-Barnett, 1992).

The Social Context of Communication: Time Limitation and the Physical Care of Patients

While research has acknowledged the general difficulties of communication, some research has emphasized the need to make time for patients (Audit Commission, 1992). Being too busy and not having enough time to talk with patients is frequently offered by nurses as a reason for the low quantity and quality of nurse-patient communication.

However, some research indicates that nurses do not always use quiet, less busy periods to talk with patients. In Macleod-Clark's (1983) study, nurses were audio-recorded as they went about their normal nursing duties. The amount of time nurses spent in direct one-to-one contact with patients was low, although over 50% of these sessions took place when the nurses described the ward as "very quiet" or fairly quiet."

Although research has examined the nature and duration of nurse-patient communication, few studies sufficiently acknowledge the extent to which communication is influenced by perceptions of these involved or the social context in which

communication occurs. Byrne and Heyman (1997) studied nurses' perceptions of their role and purpose in the Emergency Department. These nurses saw their role and purpose as being primarily concerned with dealing with emergencies and providing urgent physical care. This social and environmental context impacted upon the amount of time allocated to each patient and to the way patient's anxieties were dealt with. When physical care of the patient and the time factor were priorities, the emotional care of the patient became secondary.

Control of Communication

Previous research tended to describe nurses as controlling and directing nurse-patient conversation onto safe topics, such as physical care and social chit-chat, by use of various verbal behaviors or by complete avoidance of the patient. Macleod-Clark (1983) demonstrated that the majority (83.5%) of nurse-patient communication was initiated by the nurse rather than the patient, suggesting the nurse had more control and authority over the conversation than the patient.

Macleod-Clark (1983) also found that blocking and avoidance techniques employed by nurses are possible consequences of inadequate or inappropriate verbal skills. Wilkinson (1991) suggested that other reasons for blocking and nurses' avoidance of the patient can result from anxiety about upsetting the patient, or not being able to cope, or a fear of death, as well as lack of communication skills training or time.

Macleod-Clark (1983) and Wood (1979) discussed the nursing strategy of "popping in and out" or "dashing in" on patients to avoid spending lengthy amounts of time with patients. Such a strategy might be useful in providing physical care, but it would make it difficult to ensure that the anxieties of patients were identified and dealt with. Such an approach might be likely to deter patients from expressing any worries or

making any demands on a nurse.

These studies supported the common finding that nurses' interactions with patients, through verbal and visual communication, are brief, predominantly task-centered, and concerned with physical care. Nurses appeared to restrict communication with patients to those interactions which were necessary for the patient's progress through the department.

The Neglected Contributions of Patients

Jarrett and Payne (1995) have argued that research has over-emphasized nurses' roles in nurse-patient communication, particularly their communication skills. Recent research has tended to ignore patients' views of, and verbal contributions to, nurse-patient communication. There has been a failure to take into account patients' perceptions of nurses, what they wish to divulge to the nurse and how other factors may influence the patient. The focus has been on what nurses are saying and doing during nurse-patient conversations and the patient has been largely ignored. Several important points have not been thoroughly discussed, such as environmental and organizational factors and expectations acting upon both nurses and patients that potentially influence nurse-patient communication.

Patients may have less control and power than nurses but they are not completely passive and may be quite knowledgeable in certain areas of their own health care. The patient may be active during nurse-patient communication and this activity should not be minimized. Jarrett and Payne (1995) suggest that patients' contributions to the content and organization of nurse-patient communication have been rarely sought, but could be informative.

Research and Knowledge Bases

The theoretical framework for this study is drawn from research bases in the following: communication theory and models, systems theory, instructional design, visual literacy, formative evaluation and diffusion and utilization research.

Communication Theories

Richey (1986) has described communication theory as being influenced by both general systems theory and information processing. Communication has been viewed as a system with the primary components being a message "source," usually a human being, the "channel" who "encodes," and the message "receiver" who "decodes" the message and attaches meaning to it. The channel can be viewed as a delivery system, the medium or vehicle of message transmission (Schramm, 1977). Usually the message is organized through the use of language, verbal or written, although much recent research has focused on visual communication.

The source of a message is the sender's mind which is translated into some symbolic form, words, graphics, or pictures. The receiver decodes the signal and attaches meaning to the symbols according to his or her field of experience. The destination is the receiver's mind (Moore & Dwyer, 1994).

"Noise" refers to factors that influence or disturb messages while they are being transferred along the channel from the source to the destination. In human communication, noise may refer to any random extraneous disturbance, such as audible sound or ambiguous language, perceptual distortions, or psychological misinterpretations. The concept of "noise" is important because it can distort messages and can be auditory or visual. Noise changes the meaning of a message as it is sent from sender to receiver and can lead to errors in communication (Northouse & Northouse, 1992).

Communication theory involves explanations of the process of transmitting this information, the form and structure of the information , and the functions and effects of the information. While some communication theory may deal with areas of engineering, machines, hardware and software, the purpose here is to deal with human communication between individuals or small groups.

Communication Models

Many information and communications theorists have devised models to explain the way the communications process functions. Since the 1940s, a wide range of models of communication has been developed, some dealing with the process of interpersonal or organizational communication, others focusing on audiences, still others on the means of transmission. Some models have been very simple, one way and linear, while others have been complex with interconnections and feedback loops, non-linear and almost three-dimensional. Each of the models is graphically represented in Appendix A.

A simple early model was developed by Laswell in 1948. He described the basic elements of communication as "Who says what in which channel to whom with what effect?" (Moore & Dwyer, 1994, p. 88). In this one-way linear model, the communicator has a clear intent to influence the receiver with the message. The basic elements of communication are sender, message, channel and receiver.

Another early model of communication was developed by Shannon and Weaver in 1949. They defined communication as a one-way linear process and their model reflected this thinking. In this highly influential model, communication is represented as a system in which a "source" selects information that is formulated, or "encoded," into a message. This message is then transmitted by a signal through a "channel" to a "receiver." The receiver interprets or "decodes," the message and sends it to some

destination. The role of the receiver is to change the signal back to the message before it reaches its destination.

A unique feature in the Shannon-Weaver model is the concept of "noise." The "noise source" may alter the signal which may mean that the message arriving at the destination is not the exact one sent from the information source. According to Shannon and Weaver (1949), noise is one reason communication fails.

Another influential model was developed by Wilbur Schramm (1954). Schramm believed communication was endless, not something that began in one place and ended in another. Schramm's model was somewhat different from other models in that he included "fields of experience" between the sender and the receiver. Schramm noted that communication can occur only when the encoded message fell somewhere in the overlapping fields of experience.

A major difference between the Shannon-Weaver model and the Schramm model is the focus. Shannon and Weaver focused on the channel of communication, the medium or vehicle, whereas Schramm focused his model on the behavior of the senders and receivers.

Another linear model that focused on the characteristics of the sender and receiver was developed by Berlo in 1960. Berlo identified characteristics of both sender and receiver as being comprised of communication skills, attitudes, knowledge, social system, and culture, and was "a model of the ingredients in communication" (p. 24). Between the Source and the Receiver were the Message and the Channel, each also comprised of five characteristics, or variables. Message included Elements, Structure, Content, Treatment and Code. Ingredients that made up the Channel included seeing, hearing, Touching, Smelling and Tasting (Berlo, 1960).

The Systems Approach and Models of Instruction

To deal with questions raised from discussions regarding the need for a communication tool, an organized, systematic approach to the problem was developed. The term *systematic* has been defined by Seels and Richey as "Using processes or step-by-step procedures that allow one to create systems composed of interrelated, interwoven elements that together constitute a whole." (Seels and Richey, 1994, p. 133). The Systems Approach was selected because it was felt that through this approach one could identify in an objective manner:

- what the needs were,
- who the audience or audiences might be, and
- how to meet these needs.

Once the communication tool, tools, or job aids, were developed, the systems approach could be used to test the tool, pilot it, assess its effectiveness, and continue improving through formative evaluations.

The fields of Instructional Technology, Educational Technology, Curriculum Design and other related fields have developed a large body of theories and models of instruction. The models are either conceptual in nature, painting the grand design or concept, or procedural, giving step by step linear directions (Richey, 1986).

Another way to categorize the many models used by designers of instruction has been described by Gustafson (1991), who identifies three broad categories: the classroom focused model, the product focused model, and the systems model, or systems approach. The categories are not mutually exclusive and sometimes overlap. No hierarchy among the levels is intended.

Gustafson (1991) used the term "systems approach" interchangeably with other

terms, such as: instructional development, instructional systems development, instructional technology, and educational design. He defined instructional development as "a process of systematically designing, sequencing, implementing, evaluating, and constantly monitoring instruction with the intent of improving its quality and effectiveness." The Association for Educational Communication and Technology (AECT) has defined Instructional Development as "A systematic approach to the design, production, evaluation, and utilization of complete systems of instruction, including all appropriate components." (1977, p. 14).

The classroom-focused model assumed there was already a teacher, students, a curriculum, and facility. The goal was to do a better job of instruction with emphasis usually placed on selecting and adapting existing materials and instructional strategies. In the product-focused model, "the goal is to prepare an effective and efficient product as quickly as possible" (Gustafson, 1991, p. 16).

In the systems-focused model, the goal was development of instructional output, which may be considered to be a system. The output of the development process may include materials, equipment, a management plan, and possibly an instructor training program. This system may employ a problem solving approach, with the data collected from surveys and interviews, to determine the precise nature of the problem. This phase can be called the Front-end Analysis or Needs Assessment. Other areas of analysis in the system-focused model are the particular characteristics of the task and the environment where the system will be used (Gustafson, 1991).

The Dick and Carey Model (1996) is a classic model of instruction. This model has many things in common with other models. They begin with some type of initial needs assessment, what is the problem, what is needed. They identify the target audience

and audience characteristics, objectives which determine the direction of development, and evaluation processes to measure effectiveness. Throughout this development, and once the product or program has been implemented, formative evaluation is completed at regular intervals to obtain feedback to determine if the program or product is meeting the objectives. While different designers have unique terminology for steps in their models, the overall design and system are similar.

Another classic model, Interservice Procedures for Instructional Systems Development (IPISD), was developed by Branson (1981). Branson's model is a conceptual framework which is organized into five broad phases, or stages. Phase I is the Analyze phase which is broken into five subphases. Phase 2 is the Design portion and includes four subphases. The next phase is Develop, which also has five subphases. The Implement phase is comprised of two subphases. The final phase, Control, is the evaluation section, made up of three subphases.

Formative Evaluation

Scriven (1967) identified different roles of formative and summative evaluations, terms now universally accepted in the field of instructional design (Worthen & Sanders, 1987). Formative evaluation is conducted during the operation of a program to provide program designers, managers, or directors evaluative information that can be used to improve the program. For example, during the development of a curriculum package, formative evaluation would involve content inspection by experts, pilot tests with small numbers of children, field tests with larger numbers of children and teachers in several schools, etc. Each step would result in immediate feedback to developers, who would then use the information to make necessary revisions to improve the program. Summative evaluation is conducted at the end of the program to provide potential consumers with

judgements about that program's worth or merit (Scriven, 1967).

The use of formative evaluation gives the evaluator and the program staff a chance to examine the program's effectiveness and enables the evaluator/designer to:

- scrutinize and rethink assumptions and activities that underlie the program,
- conduct small-scale pilot studies and
- experiment with newly developed program components. (Fitz-Gibbon & Morris, 1987)

More than 90% of models in the instructional design literature include formative evaluations as a necessary element (Andrews & Goodson, 1980). Educational designers agreed that instructional products should be evaluated and revised during developmental stages to insure that products are meeting stated objectives and therefore are on the right design path. Flagg (1990) indicated that the purpose of formative evaluation was to help: "the designer of a product, during the early development stages, to increase the likelihood that the final product will achieve its stated goals" (p.1).

Thiagarajan (1991) has defined formative evaluation as a means of assessing the worth of a project to improve its cost-effectiveness or using the process to stay on track as well as for continued product improvement. Formative evaluations help product designers during the early development stages to increase the likelihood that the final product has achieved its stated goals. Valuation in this definition means the systematic collection of information for the purpose of informing decisions to design and improve the product. The term formative indicated that information is collected during the formation of the product so revisions might be made cost-effective (Dick & Carey, 1996).

Field Testing

According to Tessmer (1993), a field test "is a situated evaluation, because it is

done in situations that are identical to those in which the instruction will actually be used" (p.152). The difficulty in field testing is making revisions because numerous sites may be involved, as well as large numbers of people. In extended field testing, it is recommended that formative evaluations be conducted for the duration of instruction. Extended testing is a type of continuous field test in which evaluations and revisions are conducted on a regular basis while the product is being used. Extended field tests are not considered summative evaluations (Komoski & Woodward, 1985; Misanchuk, 1976).

Diffusion of Innovations

In the late 1960s, the concept "diffusion of innovations," referring to the communication process used to spread information and involve users in order to facilitate adoption of an idea, was introduced. This area was stimulated by the publication of "Diffusion of Innovations" by Everett M. Rogers in 1962. Rogers (1994) defined diffusion as the spread, adoption, and maintenance of an innovation, and later as the process by which an innovation is communicated through certain channels, over time, among members of a social system.

Briggs (1977) included diffusion as part of his instructional design model, beginning with the design phase and continuing through the formative evaluation phase. He defined diffusion activity as " . . . the process of securing widespread school adoptions of a new curriculum or an instructional system." (p. 298). Seels and Glasgow (1990) included "Dissemination and Diffusion" as the last stage in their instructional design model titled: Project management (Gustafson, 1991).

Burkman (1987) described the five step process used in the Rogers model as follows:

1. At the *knowledge* step, the potential adopter becomes aware of the program

and gets a rough idea of how it works or what it does.

2. At the *persuasion* step the potential adopter seeks more detailed information and forms a favorable or unfavorable attitude toward the program.

3. In the *decision* phase, the potential adopter carries out activities that lead to a choice to *adopt* or *reject* the program. Adopt means to decide to make full use of the program. Reject means to decide not to adopt or not to consider adoption.

4. At the *implementation* stage, the adopter puts the program into use. This stage is also referred to as *implementing the program.*

5. *Confirmation* occurs when the adopter collects information to confirm the adoption decision. Positive information leads to continuance of the program . Negative information leads to discontinuation, reinvention or modification of it.

Once a product has been developed, the process of implementation and institutionalization begins. Like summative evaluations and diffusion, implementation planning is often omitted by organizations due to a shortage of time, money, or staff (Seels & Richey, 1994). The difference between diffusion of innovations and organizational development (OD) is that OD is primarily concerned with change in organizations, and diffusion of innovations "is primarily concerned with individuals accepting and using ideas" (Rogers, 1994, p. 45). AECT's (1977) definition of diffusion linked utilization and dissemination into one function, Utilization-Dissemination. The purpose of the function was 'to bring learners into contact with information about educational technology" (p. 66).

Utilization

Utilization has been defined as "the act of using processes and resources for learning" (Seels & Richey, 1994, p. 134). The term is often interchanged with usage, dissemination, diffusion or implementation. Burkman (1987) has stated "implementation is defined as putting the program into use" (p. 435).

While many models exist for designing instruction and instructional products (Andrews & Goodson, 1980; Gustafson, 1991), the instructional design process often functions poorly when the product is to be implemented, or put into practice, under real world conditions, involving people, cost factors, and time constraints (Back & McCombs, 1984; Butler, 1982). The problem of utilization not only occurs in the business environment, but also in educational settings of high schools and middle schools (Berman & McLaughlin, 1978; Centra, 1976; Dressel, 1982, Heinich, Molenda & Russell, 1993), as well as in military and industrial settings (Branson, 1981; Miles, 1983).

Some designers have stated that utilization could be improved if designers systematically designed their products to be user-friendly and if users received the follow-up support they required (Burkman, 1987; Guba & Clark, 1975). Burkman (1987) suggested that designers use concepts and models regarding communication and dissemination of innovations proposed by Rogers (1994). Rogers, through his ground breaking work in diffusion of innovations, made important contributions to the area of utilization because utilization depends on the promotion of awareness, trial and adoption of innovations. Burkman also suggested using specific ideas from Urban and Hauser (1980).

Visual Literacy

Literacy and visual literacy have been closely linked and often definitions of the terms overlap each other. "Today literacy is the skills with which man manipulates the many media of mass communication" (Postman, 1971, p.26). Seels (1994) has stated that literacy has been stretched beyond the definition of reading and writing letters, as a reaction to technological advancements in communication. Visual literacy and media literacy, according to Seels, have become established, intertwined educational jargon.

Horton (1994, p. 103), has defines visual literacy as "The ability to understand (read) and use (write) images and to think and learn in terms of images."

Feldman (1976) raised a number of questions regarding differences between "reading" and understanding visuals. Visual literacy not only involves "reading" visual images, and using and creating visuals, but more importantly, it is a method or process for thinking.

Debes (1969) coined the term visual literacy which is based on the association of knowledge, theory, and technology in many areas. The "Rochester School" of Debes, Williams, and Turbayne molded the development of theoretical foundations of visual literacy (Hortin, 1994).

Theoretical Foundations of Visual Literacy

"Visual Literacy is really training for visual thinking" (Hortin, 1994, p. 104), with Jonassen & Fork, (1978) noting that "Visual literacy is eclectic in origin" (p. 7). Although many disciplines have contributed to knowledge and understanding of visual literacy, almost all major ideas and concepts of visual literacy can be traced to four areas of study:

- linguistics,
- art,
- philosophy, and
- psychology (Barley, 1971; Debes, 1969, 1972; Hortin, 1994).

Linguistics. Fries (1952) suggested that meaning in verbal language was derived from the study of verbal structure and elements. His ideas became a rational for visual literacy training. He paved the way for analyzing meaning in verbal language. Researchers applied Fries' theory on verbal language to visual language, claiming that

one can find meaning in visual language through the study of visual composition, syntax, and elements (Fries, 1952). "One cannot speak or understand a language without 'knowing' its grammar" (Fries, 1952, p.57). The study of visual elements; such as color, form, syntax, and composition; could enable an individual to find meaning in visual information. Understanding verbal elements to derive meaning was analogous to understanding visual elements to understand visual information.

Chomsky (1975) coined the term universal grammar. Proponents of visual literacy have suggested that if there are universals in verbal language, there are universals in visual language as well (Debes, 1969).

While Fries (1952) provided the theory that meaning could be derived from the study of elements, Chomsky's ideas of a universal or innate language justified the teaching of certain universal elements in visual language. If such universal elements exist, the recognition of those elements is an important step toward being visually literate. Both Fries and Chomsky provided the original theory for the justification of visual literacy training (Moore & Dwyer, 1994).

But the linear structure of verbal language differs from that of visual language. Dondis (1973) disagreed with linguists when he suggested that "We create a design out of many colors and shapes and textures and tones and relative proportions; we relate these elements interactively, we intend meaning" (p.20). "Visual literacy cannot ever be a clear-cut logical system similar to language. Languages are made-up systems constructed by man to encode, store and decode information. Therefore, their structure has a logic that visual literacy is unable to parallel" (Dondis, 1973, p.12).

Art and Visual Thinking. "Visual literacy draws heavily on the field of art" (Barley, 1971). Art's contribution in the development of a theoretical foundation for

visual literacy is Arnheim's (1969) theory regarding visual thinking. "Visual thinking calls . . . for the ability to see visual shapes as images of the patterns of forces that underlie our existence- the functioning of minds, of bodies, or machines, the structure of societies, or ideas" (p. 307). Arnheim warned against assuming that visual literacy alone could lead easily to visual thinking. Visual literacy is a means to visual thinking, which is as much a processing of information as it is knowledge of visual elements. "A visually literate person should be able to process information visually as well as verbally, and the processing of information visually which might be called visual thinking" (Arnheim, 1969, p. 315).

Philosophy. Turbayne, professor of philosophy at University of Rochester, was the most influential individual in the development of visual literacy theory (Moore & Dwyer, 1994). Visual literacy training becomes important in terms of understanding the environment, and not accepting mechanical explanations of reality. Turbayne proposed theories regarding relationships of verbal and visual languages. In the same way that individuals "learn" to relate sounds and verbal definitions to what is referred to, they relate visual information to what they have already "learned" about their physical world. Turbayne sited the famous Molyneux experiment, where blind people are suddenly able to see, to demonstrate that the relationship between the physical and visual world is not established without a learning process.

Psychology and the Perceptionists. In the area of psychology, the research of the "perceptionists" has had a strong influence on visual literacy theory. The concept of visual literacy was derived to a great extent from perceptionist theorists. The connection between the eye, mind, and learning process is the focal point of perceptionist's theory. "Perception is a form of learning . . . Visual perception equals seeing plus

cognition"(Amey, 1976, p.7). Language is a learning tool that "makes learning explicit instead of tacit," (Gibson, 1986, p.13), with pictures also being vehicles of learning.

Perception is an integral component of visual literacy. It is a complex and ongoing process that influences related activities of communication and learning. Perception consists of several components or stages: selection, organization, comparison, and interpretation of data (Fleming & Levie, 1978).

Perception deals with the ways that individuals sense or become immediately aware of their environment. (Fleming & Levie, 1993). Where it is desirable in instruction to replace the real world with some substitute or surrogate, such as a photograph or drawing, it is important to know how to represent that reality adequately for perceptual purposes (Dwyer, 1987).

While it is difficult to predict what an individual perceives at a given time and in a given situation, it is possible to consider some of the major ways in which perceptions will vary, and some of the conditions under which they will vary. Knowing some basic principles of perception, the message designer can arrange conditions that are consistent with the perceiver's, or audience's, general needs (Fleming & Levie, 1993).

Perceptual organization

Perceptions are organized and consequently the message designer can facilitate and control perceptual processes by the way s/he organizes messages. Chaos is not easily perceived in the environment, whether it is visual or auditory. Rather, individuals perceptually construct order through relationships, groupings, categories of objects, events, words, and people.

Organization, whether spacial or temporal, of a stimulus can influence the speed and accuracy of perception (Fleming & Levie, 1993). Three key perceptual principles are

similarity, differences, and proximity. People group similar things and separate different things. This process is influenced by the spatial or temporal proximity of these stimuli. Perceivers partition available information into appropriate item sizes depending on the stimuli, their experiences, intentions, and mental capabilities. Techniques for storing and recalling information are called chunking, clustering or grouping.

Perceiving objects, pictures and words

Where alternative figures can be constructed by a perceiver, the most likely is usually the simplest and most symmetrical figure which the available stimuli allows (Horton, 1994). This idea has been referred to as the minimum principle in the sense that differences and complexities are minimized. When the available stimulus or message is a simple element, such as traffic signs, the response or perception should be unambiguous, but if the stimulus is complex, such as in a work of fine art, there may be a variety of "economical" or simple interpretations or explanations. Certain kinds of visual stimulus features, such as contours, or edges of object and shapes, are accentuated in perception, while others, such as uniform areas, are not (Horton, 1994).

Information Processing of Words and Pictures

The term "visual" had been defined in various ways, depending on who is using the term. Some researchers see the term as synonymous with "iconic," (pictures, globes, maps) and not including verbal signs (print). Some psychological researchers conceptualize "visual" as synonymous with printed words, ignoring visual iconic signs. A more encompassing definition could speak of "visual modality" that includes perceptions of both iconic signs, pictures, maps, diagrams, and verbal signs (words, print). "Audition" is still conceived of as the sensory modality for spoken words.

Digital messages (printed words, numbers) can be perceived through auditory or

visual modalities, or both. Iconic messages can only be perceived through vision. (Fleming & Levie, 1978). Learning research clearly favors pictures over words. Signs, printed words, or pictures, differ in the ways they are perceived (Fleming & Levie, 1978).

Speech apprehension is limited by the temporal nature of the auditory stimulus. Speech occurs in time, generally with no repetition, no going back, and no control of pacing by the receiver. Print and picture apprehension is more dependable because it does not take place in time but in space, and therefore can be studied leisurely for deeper comprehension (Fleming & Levie, 1993).

Information processing is not limited by the sign type of the stimulus. Pictorial stimuli can be recoded into mental words. Pictures often function as a multi-sign stimulus, arousing both imagery and verbal processes in the perceiver. Verbal stimuli can be recoded into mental images. Words can arouse imagery in the mind of a reader and imagery can improve memory for words (Paivio, 1971).

Information and material to be encoded should be well organized for perceptual and learning purposes, and delivered at an appropriate rate of speed. If the material is presented too quickly, it will not allow enough time for processing to occur; if information is presented too slowly, it may allow the perceiver to perform unnecessary or erroneous coding operations (Miller & Burton, 1994).

The better organized or patterned a message is perceived to be, the more information we can receive and process at one time. For example, a string of nine numbers is more difficult to perceive than three strings, or groups, or three numbers, as in phone numbers.

Research has shown that people can perceive up to seven items at a glance. These are familiar items and they can recall some of their attributes, such as number or name. In

addition, individuals can store about seven familiar items in immediate short-term memory. Seven stimuli, whether from the visual or auditory modalities appear to be a reliable measure of human capacity (Miller, 1968).

Right and left brain

Within some visual literacy proponents, the importance of the "mind" in perception has taken on significance. Amey (1976) stated that scholars such as Mead, Fearing, and Buber espoused such opinions, leading some to the position of using left and right brain hemispheric research to support visual literacy ideas.

Other researchers have warned against an emphasis on just left and right brain research. They suggest a broader perspective be used that would result in other areas of mind research, including brain chemistry, psychobiology, unconscious intellect, visualization, biofeedback, and mind-body connections. Researchers generally agree that mental processing of information, both verbal and visual, need to be studied further before a substantiative theoretical foundation can be formulated (Fleming & Levie, 1993).

Information Processing Using Auditory and Visual Modalities

Some evidence exists that auditory and visual information is processed separately in the two cerebral hemispheres. The left hemisphere appears to specialize in serial information, such as languages and speech. The right hemisphere seems better suited for simultaneous information, especially spatial stimuli such as pictures (Fleming & Levie, 1993; Miller & Burton, 1994). Communication which combines words with relevant and related illustrations can provide the greatest gain because the processing occurs in both hemispheres and seem to reinforce each other. The capacity to process information appears to be greater when both auditory and visual modalities are utilized.(Severin,

1967).

While the message designer wants to communicate as much information per message or per unit of time, the capacity of the learner or receiver to perceive, decode, and store information sets very important limits. Estimates as to the capacity for information storage and retrieval are still tentative. For words presented auditorially, the estimates range up to 400 words per minute for a prose passage. For pictorial capacity, learners can remember or recognize about 2,500 pictures with 90% accuracy, at a rate of one every 10 seconds (Moore & Dwyer, 1994).

The weaknesses of auditory channels are especially evident in difficult material. Therefore the message designer must use shorter sentences for auditory material, more redundancy and excellent technical quality (Fleming & Levie, 1993).

Attention

Attention refers to the ability of a person to focus on a specific stimulus without being distracted. The ability to attend is essential for all learning and is closely interrelated with perception and memory. Interesting messages tend to be perceived as relatively short and not too difficult. Divide long difficult messages, concepts into small, relatively short easy steps, or chunks.

The implication for communication of the above two points is that the message cannot be overly complicated or busy, but must be designed in small pieces to be perceived clearly and easily without confusion. Some parts may be accented to gain attention, other parts may be de-emphasized to prevent distraction. At the same time the message must not be so inactive and dull as to lose the attention of the audience, and make them attend to some other stimuli (Fleming & Levie, 1978).

Summary

This chapter has reviewed the literature on nurse-patient communication in the healthcare setting. The review of the literature has also included the research and knowledge bases such as communication theory and models, formative evaluation, Diffusion and Utilization, and Visual Literacy. Chapter III reviews the Methodology utilized to analyze the data.

CHAPTER III

METHODS

This chapter provides the methods that were used to collect and analyze the data needed to answer the research questions developed for this study. The topics that were included in this discussion are: research design, setting of the study, description of the population and sampling techniques that were used to select participants for the study, instrument, data collection procedures, and data analysis.

Research Design

A nonexperimental, correlational research design formed the framework of this study. This type of research design is appropriate when the independent variable is not manipulated and no treatment is provided to the participants in the study. A correlational design provides an opportunity to examine the degree of relationship between two or more variables and how these variables might affect a pattern of behavior (Borg, Gall, & Gall, 1993).

Setting

A large suburban hospital with 1,000 beds was the setting for this study. This general medical/surgical hospital primarily serves patients from the metropolitan Detroit area. The level of care extends from primary emergency to intensive care units, with both outpatients and inpatients served by the hospital.

Because of the extent of services and care provided by the hospital, both communicative and noncommunicative patients are included in the hospital population. Noncommunicative patients can be either patients who are unable to speak because of a

physical illness/accident or patients who are unable to communicate because their primary language is not English. Specific units in the hospital; such as intensive care, cardiac care, stroke, and rehabilitation; have higher incidences of noncommunicative patients in their case load.

Population

The population defined for this study are medical personnel who are directly involved in caring for noncommunicative patients. The population includes nursing and rehabilitation professionals, as well as aides and assistants in these areas that provide direct patient care. Specifically, registered nurses, physical and occupational therapists, physical and occupational therapy assistants and aides, respiration therapists, speech therapists, and direct care nursing assistants were asked to participate in the study if they work with noncommunicative patients and are aware of The Beaumont Communication Tool. Approximately 400 medical personnel meet the criteria for inclusion in this study.

Sample Selection

A purposive, nonrandom sample was used for this study. As participants must have worked with noncommunicative patients and be aware of the Beaumont Communication Tool, a short letter was sent to all medical personnel in the following units: Critical Care, Stroke, and Rehabilitation. The letter asked employees to answer two questions:

1. Does the employee work with noncommunicative patients?
2. If yes, has the employee ever used the Beaumont Communication Tool?

If the answer to the second question was yes, that employee received a survey packet and

was included in the sample. All employees who answered no to the second question were excluded from the sample. The total sample size was 135 employees.

Development of a Communication Tool at Beaumont Hospital

Assessing the Needs of Patients and Staff

Beginning in 1987, after some complaints from the nursing staff, William Beaumont Hospital began surveying the staff asking what could help improve communication with nonEnglish-speaking patients, particularly those from the Arabic/Chaldean community, Beaumont's largest foreign population. One of the more practical and popular suggestions to come from the nursing staff suggested that a Language Tool should be created. The tool would be a simple, basic visual tool to identify objects, items in the patient's environment, the patient's room, the bathroom, and certain emotions, such as happy and sad, hot and cold.

A Language Tool Task Force was initiated, with members of the Task Force passing out questionnaires to their colleagues. Questionnaire responses helped the Task Force identify the types of information which should go into a Language Tool. The goal of the Task Force was enlarged not only to facilitate communication with Chaldean population, but also with all patients having communication problems. A list was created and passed on to the Beaumont Hospital Graphics Department for the visuals to be created. At the time, the idea was to create drawings of the items. To help the artist, a number of photographs of different items were taken. The project was begun by the artist, but for a variety of reasons, it was discontinued.

With the enactment of the Americans with Disabilities Act (ADA), the demand for a communication tool once again surfaced at Beaumont Hospital. In addition, since

the time when the tool was first initiated, the number of nonEnglish-speaking patients from Arabic speaking lands, as well as South East Asia, India, and Eastern Europe had increased substantially. These changing conditions increased the demand for a communication tool to facilitate treatment with these patients.

A prototype model was circulated among various Nursing committees, including the Hospital Education Committee, the Patient Education Committee and the Department Managers Committee. They felt the project was worthwhile and should be continued.

Review of "Commercial" Communication Tools

One of the first questions raised, after identifying the need, was "Is there a tool that has already been developed, that can meet our needs?" After reviewing several types of communication tools, it was agreed that they were too focused or restrictive, the physical size was too small, or too expensive even if bought in large quantity. The various committees involved made a decision to develop a tool specifically to meet patient and staff needs.

Questions Raised by the Need for a Communication Tool

From the very beginning, a number of questions arose as to the nature, or scope, of the Communication Tool, and who the audience should be.

1. What should be the content of this tool? What kinds of objects, text, items, activities, or other areas should be covered?

2. How much should be visual and how much verbal? In what type of organization, structure or design?

3. Was there a particular sequence that should be followed for the text messages? For the graphics?

4. How large should the visuals be, given the elderly population with low vision? How large the text, the graphics?

5. Was there a preferred format, either portrait or landscape, large scale or standard page size, that would be more appropriate, given the needs and

audience.

6. Exactly who was our audience, patients, families, staff? Should there be separate tools developed for the different groups? Should there be a tool for children? What would be the differences between the tools? Would the differences be in content, in format?

7. Should all English text be translated into Arabic?

8. How should this tool be cost-effective?

Need for Systematic Approach to Tool Development

As these questions were raised and the project became more complicated the need arose for a systematic approach to the development of the communication tool. While there was no single model, either a communication model or a systems model, that was utilized, the systems approach, or a systematic problem-solving approach was utilized from the outset. A good model that reflects the steps taken would be the Interservice Procedures for Instructional Systems Development (IPISD) model. In this model there is an initial assessment of needs, design of the product, actual development and pilot testing phase and feedback. Throughout the development process, a formative evaluation process takes place to assist in refining the product. The IPISD model, as well as the process that was followed in the development of the communication tool, can be seen as a series of steps leading to the final product.

Sequence of steps needed to develop a communication tool

1. Identify content experts, or Subject Matter Experts (SMEs) in Med ICU and Surgical ICU, Rehab, includes Speech, PT, OT, Closed Head Injured, stroke patients, to develop needs assessment regarding their patient populations. Clinical Nurse Specialists or other educators make good SMEs.

2. Design instruments based on SME inputs. Questionnaires were used to survey the staff regarding what they see as a communication need in their patient population. Mail out surveys and interview staff. These survey responses and interviews lead to communication tool development and refinement over a period of eight years.

3. Develop the communication tool or tools in both verbal and visual format, in foreign language if needed.

4. Pilot-test the tool with selected staff populations.

5. Continue to revise communication tool based on feedback from different areas of the hospital, Intensive Care Units (ICUs), Rehabilitation areas (includes Speech Pathology, Occupational Therapy, Physical Therapy).

Formative evaluations were conducted on an ongoing basis with the tool being refined based on the feedback of nursing staff. The feedback included:

- returned surveys,
- old communication tools being returned with revisions, additions, deletions, and
- informal discussions and telephone conversations.

Objectives of Communication Tool

Using the completed communication tool, patients should be able to:

- communicate their needs, both physical and emotional, to family members and hospital staff
- communicate using written verbal statements pertaining to their physical and emotional needs, environments, activities
- communicate using the visuals in the tool, regarding their physical and emotional needs, their environment and activities.

Using the completed communication tool, family members should be able to:

- communicate with their loved ones regarding the patient's needs, both physical and emotional
- use verbal and visual sections of the tool to communicate with staff regarding the patients' environment and activities.

Using the completed communication tool, hospital staff should be able to:

- communicate with patients and their families regarding information the staff needs in order to provide the best medical care for the patients.

Formative Evaluation of Communication Tool

In the past year, the tool has been pilot tested throughout the hospital, focusing on patient care areas, including both medical and surgical nursing areas and Rehabilitation areas such as Speech Pathology, Physical Therapy, and Occupational Therapy.

Surveys have been included in nursing newsletters (Appendix D). The original and simpler version of the communication tool, along with surveys, were distributed through the various area and hospital wide Education and Research Committees and task forces. Clinical Nurse Educators, diabetes educators, dietitians and other individuals who did specialized patient teaching were given the surveys and the tool it its initial simple format. The nursing newsletter, Partners in Excellence, featured articles and surveys regarding the Communication Tool. Numerous telephone discussions took place, trying to identify types of patient communication needs for a particular area. Informal focus groups were established by clinical nurse specialists whose jobs included in-depth patient teaching on the units and teaching nurses how to teach patients. Survey responses and interviews lead to the Communication Tool development and refinement over a period of eight years. Based on these results, a number of conclusion were drawn that led to further development of the tool.

1. Identify communication needs in two areas: the physical needs and the emotional needs. In the area of physical needs, investigates the physical care of the patient, needs dealing with medical and pragmatic concerns (see Maslow's Needs Hierarchy). The second types of communication needs are those needs dealing with the affective life of the patient, the emotional life. Identify needs that can encourage the expression of thoughts and feelings in the patient's life while they are in the hospital.

2. Need many more text categories and statements, dealing with specific issues such as pain and medication, personal feelings, specific requests from patients unable to speak or move.

Description of communication tool

The present version of the communication tool is divided into 2 parts, text (verbal) and visuals (illustrations). Both text and visuals are large in scale, for the elderly low vision patient, or for the patient who cannot wear his/her glasses. In early needs assessments, staff requested visuals because they felt graphics would meet the needs of their major "problem areas" which were foreign language patients, particularly from middle-east background. As more in-depth needs analyses were completed, a number of other areas were identified where the tool could be used, such as critical care and rehabilitation areas. Patients in these areas generally cannot communicate orally or in writing.

Text sections

The text sections were also divided into two types. Some pages are designed to be used by the patient, other pages are designed to be used by the staff or family member/visitor. For example, the patient with a tracheotomy tube may want to tell the nurse "suction me" or "I need a treatment." The assumption here is that someone will be able to hold the tool to the proper page and the patient will point, or the patient is able to hold the tool, or someone holds and points and the patient blinks to confirm this is what s/he wants.

The staff routinely needs to know certain information from the patient in order to adjust treatment or anticipate changes. For example, staff may want to know "are you in pain? where does it hurt, head, chest, front, back?" These are the areas the staff will point to until the patient acknowledges in the affirmative, again by blinking, or having the patient point to the area.

Several pages in the text section are designed to be individualized by patients with

important information such as medications used, doctors' names, family members names, and important phone numbers. Patients can keep the tool with them as they move about the hospital for tests or rehabilitation, and if asked questions about their medication, the information is readily available in their tool.

A large "alphabet board" containing the alphabet, large numbers and large YES and NO, is also part of the tool. The alphabet board is used to create words, one letter at the time.

Visual sections

The second area of the tool is comprised of many visuals that can be used either by the patient, family/visitor, or staff. The graphics have been identified through needs assessment (surveys, questionnaire, discussions). The visuals are separated into two categories, "My Room" and "Bathroom." The visuals show the most commonly used objects (personal/nonpersonal), individuals (nurse/doctor), sensations (hot/cold), feelings (sadness/happiness), and activities (eating/being turned over in bed). A "pain scale" made of 5 or 6 simple faces is being added with a 10-point pain rating scale below it.

Guidelines on using the communication tool

Guidelines have been developed for both types of users: the staff member and the family member/visitor. These guidelines were written into the tool or discussed personally with the staff or family member before using the tool by the researcher or a knowledgeable staff person.

Instrument

An original survey, entitled the Beaumont Communication Instrument, was developed for this study by the author and was piloted with staff from several areas in the

hospital including the Intensive Care Unit, Speech Pathology and the Stroke areas. The instrument was used to evaluate the perceptions of staff members on the use of the Communication Tool.

Participants were asked to respond to a modified Likert Scale of 0 to 5, with 0 indicating "Have not used the tool," 1 "Strongly Disagree," 2 "Disagree," 3 "Neutral," 4 "Agree," and 5="Strongly Agree." Table 1 presents the number of questions associated with sections I thru VII which use the modified Likert Scale.

Table 1

Instrument Sections and Number of Questions Associated with each Section

Section	Number of Questions
Section 1: Your Position at Beaumont Unit Position Held Time worked in Health Care Time worked at Beaumont	
Section II: Staff Characteristics Patient population Type of patient population who would be using Communication Tool How often do you work with noncommunicative patients Use of communication tool with noncommunicative patients Indicate frequency with which Communication Tool is used	
Section III: Participation in Development of Communication Tool Participate in Communication Tool Means of participation	
Section IV: Perceived Strengths, Weaknesses of Communication Tool Subsections: • Content • Format • Text • Visuals/Drawings • Use with patients and families.	 1 to 4 5 to 10 11 to 16 17 to 21 22 to 29
Section V: Availability and Dissemination of Communication Tool	30 to 47
Section VI: Reasons Why I Would Use the Communication Tool	48 to 58
Section VII: Reasons Why I Would Not Use the Communication Tool	59 to 70

Data Collection Procedures

After approval has been received from the Behavioral Investigation Committee (BIC) at Wayne State University, the William Beaumont Hospital Human Investigation Committee (HIC), and the Nursing Research Committee, the researcher began to collect data. All employees who work with noncommunicative patients received a copy of the screening letter that asked if the employee is familiar with the Beaumont Communication Tool. The employees were asked to provide their name and Beaumont address on the letter. Employees who are familiar with the Beaumont Communication Tool, based on their responses to this letter, were sent a survey packet that included a cover letter, copy of the survey, and a sealable envelope for confidential return of the completed envelope. Internal mail delivery were used for distribution and return of the surveys.

The cover letter contained the information needed in the informed consent form as delineated by the BIC at Wayne State University. The letter included the purpose and importance of the study, voluntary nature of participation, confidentiality of the employees assuring them that all responses were presented in summarized form only, and instructions for returning the completed surveys to the researcher.

No coding was used on the surveys packets to identify the participants. They were asked to return their completed surveys within five working days. At this time, the researcher posted reminder notices in employee lounges and staff areas to encourage the nonresondents to complete and return their surveys. The researcher included his telephone number at Beaumont Hospital to allow employees to request a copy of the survey packet if they have lost or misplaced theirs. All data collection was considered complete three weeks following initial distribution of the surveys.

Data Analysis

The data collected from the surveys were entered into a computer file for statistical analysis using SPSS-8.0 for Windows. The data analyses were divided into two sections: descriptive and inferential. Descriptive statistics, including frequency distributions and measures of central tendency and dispersion, were used to provide a profile of the demographic characteristics of the employees who worked with noncommunicative patients.

The inferential statistical analyses used stepwise multiple linear regression and Pearson product moment correlations to answer each of the research questions. All decisions on the statistical significance of the findings were made using an alpha level of .05. To assist the reader in understanding the statistics that were used to answer the research questions, the statistical analysis for each research question is presented in Figure 2.

Figure 2

Statistical Analysis

Research Question	Variables	Statistical Analysis
1. Is there a relationship between staff characteristics such as unit, nature of patients, position on staff, experience with noncommunicative patients, and the staff's use of the communication tool (diffusion)?	Dependent Variable • Reasons why tool is used • Reasons why tool is not used Independent Variables • Unit • Position of employee • Experience in health care • Type of Patient • Experience with noncommunicative patients • Frequency of tool use	Stepwise multiple linear regression analysis was used to determine which of the staff characteristics can be used to predict usage of the communication tool.

Figure 2 continued

Research Question	Variables	Statistical Analysis
2. Is there a relationship between the staff's early participation in the development and design of the communication tool, and the staff's use of the tool?	Dependent Variable • Reasons why tool is used • Reasons why tool is not used Independent Variable • Participation in tool development	Pearson product moment correlation was used to determine strength and direction of the relationship between participation in the communication tool development and usage of the tool
3. Is there a relationship between perceived strengths and weakness of the communication tool, and the use of the tool?	Dependent Variable • Reasons why tool is used • Reasons why tool is not used Independent Variables • Perceived Strengths and Weaknesses of Communication Tool • Content • Format • Text • Visuals/Drawings	Stepwise multiple linear regression analysis was used to determine which of the variables that measure the perceived strengths and weaknesses of the communication tool can be used to predict usage of the communication tool
4. Is there a relationship between the perceived effectiveness of the communication tool with patients and families, and its use by the staff?	Dependent Variable • Reasons why tool is used • Reasons why tool is not used Independent Variables • Use with patients and families • Availability and dissemination of communication tool	Stepwise multiple linear regression analysis was used to determine which of the variables measuring perceived effectiveness of the communication tool with patients and families can be used to predict usage of the communication tool
5. Can the usage of the communication tool be predicted from staff characteristics, participation in early design, perceived strength and weaknesses, and perceived effectiveness?	Dependent Variable • Reasons why tool is used • Reasons why tool is not used Independent Variable • Staff characteristics • Participation in design and development of communication tool • Perceived strengths and weaknesses of tool • Content • Format • Text • Visuals/Drawings • Use with patients and families • Availability and dissemination of communication tool	Stepwise multiple linear regression analysis was used to determine which of the independent variables have a causal relationship with usage of the Beaumont Communication Tool.

Summary

This chapter has described the methods used to collect and analyze the data needed to answer the research questions developed for this study. The topics included in this discussion were: research design, setting of the study, description of the population and sampling techniques used to select participants for the study, instrument, data collection procedures, and data analysis. In addition, this chapter described the development of the Communication Tool and gave a description of its content. Chapter IV describes the results of the data analysis used to answer the research questions.

CHAPTER IV

RESULTS OF DATA ANALYSIS

The results of the data analysis that were used to describe the sample and answer the research questions are presented in this chapter. The purpose of this study was to examine the usage (diffusion) of the communication tool, as part of a formative evaluation, to determine who is using the communication tool, perceptions of strengths and weaknesses of the communication tool, and perceptions of the effectiveness of the communication tool in facilitating communications with nonverbal patients.

The survey was distributed to medical personnel working at Royal Oak Beaumont Hospital. If the people receiving the survey were familiar with the communication tool, they were asked to complete the survey. Otherwise they were either to pass it to a fellow employee who had used the tool or return it blank to the researcher. A total of 135 surveys were completed and returned to the researcher.

The first question on the survey was related to usage of the communication tool. The responses to this question were summarized using frequency distributions for presentation in Table 2.

Table 2

Frequency Distributions – Used Communication Tool with Noncommunicative Patients

Used Communication Tool with Noncommunicative Patients	Frequency	Percent
Yes	90	66.7
No	45	33.3
Total	135	100.0

Ninety (66.7%) medical personnel reported they used the communication tool at

least part of the time. The remaining 45 participants did not use the tool and were eliminated from the study.

Chapter IV is divided into two sections. The first section provides a description of the variables in the study using frequency distributions and measures of central tendency and dispersion to provide a profile of the sample and the types of patients for whom they provide services. The second section used inferential statistical analyses to answer the research questions posed for this study.

Description of the Sample

The participants were asked to report the frequency with which they used the communication tool. Their responses were summarized using frequency distributions for presentation in Table 3.

Table 3

Frequency Distributions – Frequency With Which Communication Tool Was Used

Frequency with Which Communication Tool Was Used	Frequency	Percent
Daily	4	4.6
Weekly	10	11.5
Monthly	21	24.1
Infrequently	54	59.8
Total	89	100.0

Missing 1

The largest group of respondents (n=54, 59.8%) reported they used the communication tool infrequently, with 21 (24.1%) indicating they used it monthly. Ten (11.5%) participants used the tool weekly, and 4 (4.6%) reported weekly use of the communication tool. One participant did not provide a response to this question.

The participants were asked to indicate the units to which they were assigned. Their responses were summarized using frequency distributions. Table 4 presents the results of this analysis.

Table 4

Frequency Distributions – Unit To Which Participant Was Assigned

Unit to Which Participant Was Assigned	Frequency	Percent
Medical/Surgical, Intensive Care	39	43.8
Rehabilitation	6	6.7
General patients including stroke	44	49.5
Total	89	100.0

Missing 1

The largest group of respondents (n=44, 49.5%) reported that they were assigned to units that provided medical care to general patients including those who had cardiovascular accidents (stroke). Thirty-nine (43.8%) medical personnel worked on units that included medical/surgical patients, as well patients in intensive care units. Six (6.7%) participants worked in rehabilitation. One participant did not provide a response to this question.

The participants were asked to report their job category on the survey. Their responses were summarized using frequency distributions for presentation in Table 5.

Table 5

Frequency Distributions – Job Category

Job Category	Frequency	Percent
Nurse	69	80.1
Respiratory therapist	6	7.0
Speech pathologist	4	4.7
Clinician	4	4.7
Occupational therapist	2	2.3
Physical therapist	1	1.2
Total	86	100.0

Missing 4

The majority of the participants (n=69, 80.2%) reported their job category as nursing, with 6 (7.0%) reporting their job category as respiratory therapist. Four (4.7%) of the participants classified their jobs as either speech pathologists or clinicians. Two (2.3%) occupational therapists and 1 (1.2%) physical therapist were included in the study. Four participants did not provide their job category on the survey.

The participants were asked to provide their professional experiences in health care. Their responses were summarized using descriptive statistics for presentation in Table 6.

Table 6

Descriptive Statistics – Professional Experiences

Professional Experiences	Mean	SD	Median	Range	
				Minimum	Maximum
Time worked in health care	12.43	9.35	10.00	1	40
Time worked at Beaumont	7.91	6.49	6.00	1	38

The mean number of years the participants had been working in health care was 12.43 (sd=9.35), with a median of 10 years. The range of years in health care ranged from 1 to 40 years. The length of time the participants had worked at Beaumont ranged from 1 to 38 years, with a median of 6 years. The mean number of years at Beaumont was 7.91 (sd=6.49) years.

The participants were asked to indicate the patient population with whom they had worked with most frequently. They were provided with a list of patient types and instructed to indicate all that apply. The percentages were calculated by totaling the number of affirmative responses and dividing by the total number of respondents (n=90). As a result, each item is independent and the percentages together can exceed 100%. Table 7 presents the results of this analysis.

Table 7

Frequency Distributions – Patient Population

Patient Population	Frequency	Percent
Stroke patients	61	67.8
Intubated patients	45	50.0
Non-native speakers of English	40	44.4
Cancer patients	40	44.4
Cardiac patients	38	42.2
Hearing impaired	34	37.8
Head injured	34	37.8
Rehabilitation inpatients	21	23.3
Other	10	11.1

The majority of the participants (n=61, 67.8%) indicated they worked with stroke patients, with 45 (50.0%) reporting they worked with intubated patients. Forty (44.4%)

participants each indicated they worked with non-native speakers of English and cancer patients. Cardiac patients were indicated by 38 (42.2%) of the participants. Thirty-four (37.8%) each reported they worked with hearing impaired and head injured patients, while 21 (23.3%) participants worked with rehabilitation inpatients. Ten (11.1%) of the participants reported "other" as a type of patient with whom they worked.

The respondents were asked to indicate the types of patients with whom they used the communication tool. They were instructed to check all that apply which could result in more responses than the number of respondents. The percentages were calculated by totaling the number of affirmative responses and dividing by the total number of respondents (n=90). As a result, each item is independent and the percentages together can exceed 100%. Table 8 presents the results of this analysis.

Table 8

Frequency Distributions – Patient Population With Whom Communication Tool Is Used

Patient Population	Frequency	Percent
Intubated patients	49	54.4
Stroke patients	49	54.4
Non-native speakers of English	42	46.7
Hearing impaired patients	23	25.6
Other	2	2.2

Forty-nine (54.4%) participants indicated they worked with intubated patients, with a similar number reporting they used the communication tool with stroke patients. Forty-two (46.7%) respondents used the communication tool with non-native speakers of English, and 23 (25.6%) used the communication tool with hearing impaired patients. Two (2.2%) participants indicated they used the communication tool with "other" types

of patients.

The participants were asked to indicate the frequency with which they worked with noncommunicative patients. Their responses were summarized using frequency distributions for presentation in Table 9.

Table 9

Frequency Distributions – Frequency with Which Respondent Worked with Noncommunicative Patients

Frequency with which Respondent Worked with Noncommunicative Patients	Frequency	Percent
Daily	51	57.3
Weekly	19	21.3
Monthly	9	10.1
Infrequently	10	11.2
Total	89	100.0

Missing 1

The largest group of respondents (n=51, 57.3%) reported they worked with noncommunicative patients daily, with 19 (21.3%) reporting they worked with this type of patient on a weekly basis. Nine (10.1%) respondents were working with noncommunicative patients on a monthly basis and 10 (11.2%) worked infrequently with this type of patient. One respondent did not provide a response to this question.

The respondents were asked if they participated in the development of the communication tool. Seven (7.8%) of the participants reported they had participated in the development of the communication tool. These participants were given a list of ways in which they could have participated in the tool development. Since they were instructed to check all that applied, the number of responses exceeded the number of participants who helped in the tool development. Their responses were summarized using frequency

distributions. Table 10 presents the results of this analysis.

Table 10

Frequency Distributions – Participated in Tool Development

Ways in Which Respondents Participated in Tool Development	Frequency	Percent
Completed survey in nursing newsletter	1	1.1
Completed mail survey	2	2.2
Informal discussions	7	7.8
Reviewed the communication tool and provided feedback	5	5.6
Used communication tool with patients and provided feedback	2	2.2

Seven (7.0%) of the respondents reported they participated in informal discussions, with 5 (5.6%) indicating they had participated in the tool development by reviewing the communication tool and providing feedback. Two (2.2%) participants each completed a mail survey or used the communication tool with patients and provided feedback. One (1.1%) participant had completed the survey in the Nursing Newsletter, "Partners in Excellence" as part of the tool development.

Description of the Continuous Variables

Eight subscales: content of communication tool, physical and structural aspects of the communication tool, text included in communication tool, visuals and drawings, use with patients and families, availability and dissemination, reasons why tool is used, and reasons why tool is not used were derived from the attitudinal items on the communication tool. Mean scores were obtained for each of these variables by summing the responses and then dividing by the number of items included on each of the subscales. Possible scores could range from 0 to 5 with a neutral point of 3. A score of 0 indicated

not applicable. Higher scores were more indicative of positive perceptions in regards to the content of the subscale. The mean scores were summarized using descriptive statistics for presentation on Table 11.

Table 11

Descriptive Statistics – Perceptions of Communication Tool

Perceptions of Communication Tool	Mean	SD	Median	Range	
				Minimum	Maximum
Content of Communication Tool	3.25	.97	3.50	.00	4.75
Physical and Structural Aspects of the Communication Tool	3.63	.90	4.00	.00	5.00
Text included in Communication Tool	3.59	.78	3.83	.00	5.00
Visuals and Drawings	3.53	1.00	4.00	.00	5.00
Use with Patients and Families	3.14	.76	3.29	.00	4.21
Availability and Dissemination	3.25	.74	3.36	.00	4.55
Reasons Why Tool is Used	3.74	.66	3.82	1.09	5.00
Reasons Why Tool is Not Used	2.18	.73	2.17	.00	3.60

Content of communication tool. The mean score for this subscale was 3.25 (sd=.97), with a median of 3.50. The actual scores on content of communication tool could range from 0 to 4.75.

Physical and structural aspects of the communication tool. The mean score of 3.63 (sd=.90) was obtained on this subscale. Scores on this subscale ranged from 0 to 5.00, with a median of 4.00.

Text included in communication tool. Respondents had a mean score of 3.59 (sd=.78), with a median score of 3.83. The range of actual scores on this subscale was from 0 to 5.00.

Visuals and drawings. The range of scores on the subscale measuring the perceptions of visuals and drawings included in the communication tool was from 0 to 5.00, with a median 4.00. The mean score for this subscale was 3.53 (sd=1.00).

Use with patients and families. The mean score for the subscale, use with patients and families, was 3.14 (sd=.76), with a median of 3.29. Actual scores on this subscale ranged from 0 to 4.21.

Availability and dissemination. Actual scores on this subscale ranged from 0 to 4.55, with a median of 3.36. The mean score for this subscale was 3.25 (sd=.74).

Reasons why tool is used. The mean score on this subscale was 3.74 (sd=.66), with a median of 3.82. Actual scores on this subscale ranged from 1.0 to 5.00.

Reasons why tool is not used. The mean score on the subscale, reasons why tool is not used, was 2.18 (sd=.73), with a median of 2.17. The actual scores ranged from 0 to 3.60.

Research Questions

Five research questions were posed for this study. Each of these questions were answered using inferential statistical analyses including stepwise multiple linear regression and Pearson product moment correlations. An alpha level of .05 was used to determine the statistical significance of each of the findings.

> *Research question 1*. Is there a relationship between staff characteristics such as unit, nature of patients, position on staff, experience with noncommunicative patients, and the staff's use of the communication tool (diffusion)?

A stepwise multiple linear regression analysis was used to determine which of the staff characteristics can be used to predict either reasons why the communication tool is

used or not used by the staff. The independent variables in this analysis included: unit worked, time in health care, time at Beaumont Hospital, type of patients treated by the staff, and type of patients with whom the communication tool has been used. The categorical variables were dummy coded to allow for their use in the stepwise multiple linear regression analysis.

The first analysis used reasons why the tool is used by staff as the dependent variable. None of the independent variables entered the regression equation indicating that staff characteristics were not predictors of why the tool is used.

The second analysis used reasons why the tool is not used as the dependent variable. The same independent variables were used in this analysis. Table 12 presents the results of this analysis.

Table 12

Stepwise Multiple Linear Regression Analysis – Reasons Why Communication Tool is Not Used

Independent Variable	Constant	b Weight	Beta Weight	r^2	t-value	Sig of t
Staff Uses Communication Tool with other types of patient	1.96	-1.55	-.33	.15	-3.20	.002
Staff Uses Communication Tool with Intubated Patients		.46	.31	.09	3.03	.003
Multiple R						.49
R^2						.24
F Ratio						11.80**
DF						2/76

**p≤.01

Two variables, communication tool is used by staff with other types of patients and communication tool is used by staff with intubated patients, entered the stepwise multiple linear regression equation, explaining 24% of the variance in reasons why the

communication tool is not used. The associated F ratio of 11.80 was statistically significant at an alpha level of .05 with 2 and 76 degrees of freedom. This finding provides evidence that these two variables were explaining a significant amount of variance in reasons why the communication tool is not used.

The first variable, staff uses communication tool with other types of patients, explained 15% of the variance in reasons why the communication tool is not used. The t-value of -3.21 obtained on this analysis was statistically significant at an alpha level of .01. The negative relationship between the dependent and independent variable provides evidence that staff who do not use the communication tools with other types of patients had higher scores on reasons why staff does not use the communication tool.

Staff use of the communication tool with intubated patients entered the regression equation, explaining an additional 9% of the variance in reasons why the communication tool is not used. The t-value of 3.03 produced on this analysis was statistically significant at an alpha level of.05. Staff who used the communication tool with intubated patients was more likely to have reasons why they did not use the communication tool.

Based on these findings, use of the tool with other patients and intubated patients could be used to predict staff members' reasons for not using the communication tool. The remaining independent variables did not enter the regression equation indicating these variables were not significant predictors of reasons why staff members did not use the communication tool.

Research question 2. Is there a relationship between the staff's early participation in the development and design of the communication tool, and the staff's use of the tool?

Because a sufficient number of respondents did not indicate that they had

participated in the development of the communication tool, this research question could not be answered.

Research question 3. Is there a relationship between perceived strengths and weaknesses of the communication tool, and the use of the tool ?

A stepwise multiple linear regression analysis was used to determine which of the independent variables; content of communication tool, physical and structural aspects of the communication tool, text included in communication tool, visuals and drawings; could be used to predict use of the communication tool. The results of this analysis are presented in Table 13.

Table 13

Stepwise Multiple Linear Regression Analysis – Use of Tool with Perceived Strengths and Weaknesses of the Tool

Independent Variable	Constant	b Weight	Beta Weight	r^2	t-value	Sig of t
Text included in communication tool	1.55	.28	.33	.37	3.22	.002
Content of communication tool		.21	.31	.12	3.41	.001
Visuals and Drawings		.15	.22	.02	2.04	.045
Multiple R						.71
R^2						.50
F Ratio						28.81**
DF						3/85

**p≤.01

Three variables; text included in communication tool, content of communication tool, and visuals and drawings, entered the regression equation, explaining 50% of the variance in use of the communication tool. The associated F ratio of 28.81 was statistically significant at an alpha level of .05 with 3 and 85 degrees of freedom. This result indicated that these variables were significant predictors of use of the

communication tool.

Text included in communication tool entered the regression equation, explaining 37% of the variance in use of the communication tool. The t-value of 3.22 that was obtained for this variable was statistically significant at an alpha level of .05. This result indicated that this independent variable was explaining a significant amount of variance in use of the communication tool.

The content of the communication tool explained an additional 12% of the variance in use of the communication tool. The associated t-value of 3.41 was statistically significant at an alpha level of .05, indicating the amount of variance in use of the communication tool that was explained by content of the communication tool was significant.

The last variable that entered the stepwise multiple linear regression equation was visuals and drawings. This independent variable explained an additional 2% of the variance in use of communication tool. The t-value of 2.04 obtained for this independent variable was statistically significant at an alpha level of .05. This finding indicated that visuals and drawings explained a significant amount of variance in use of the communication tool.

The relationships between the three independent variables that entered the regression equation and use of the communication tool were in positive directions indicating that higher scores on text included in communication tool, content of communication tool, and visuals and drawings were associated with increased use of the communication tool.

Scores on reasons why the communication tool was not used were used as the dependent variable in a stepwise multiple linear regression analysis with the same

variables; content of communication tool, physical and structural aspects of the communication tool, text included in communication tool, visuals and drawings; used as the independent variables. None of the independent variables entered the regression equation indicating these four variables were not significant predictors of why the communication tool was not used.

Research question 4. Is there a relationship between the perceived effectiveness of the communication tool with patients and families, and its use by the staff?

Scores on reasons why the communication tool is used were used as the dependent variable in a stepwise multiple linear regression analysis. The independent variables in these analyses indicated perceived effectiveness of the tool with patients and families and availability and dissemination of the tool. The results of this analysis are presented in Table 14.

Table 14

Stepwise Multiple Linear Regression Analysis – Use of Tool with Perceived Effectiveness of Tool with Patients and Families and Availability and Dissemination

Independent Variable	Constant	b Weight	Beta Weight	r^2	t-value	Sig of t
Perceived effectiveness of tool with patients and families	1.81	.62	.71	.50	9.33	<.001
Multiple R						.71
R^2						.50
F Ratio						9.33**
DF						1/87

**p≤.01

One independent variable, perceived effectiveness of tools with patients and families, entered the regression equation. This variable explained 50% of the variance in

use of the communication tool. The associated F ratio of 9.33 was statistically significant at an alpha level of .05 with 1 and 87 degrees of freedom. This result indicated that effectiveness of the communication tool with patients and families was a significant predictor of use of the communication tool. The relationship between these two variables was in a positive direction indicating the higher levels of perceived effectiveness of the tool with patients and families was associated with greater use of the communication tool. Availability and dissemination of the communication tool was not a statistically significant predictor of use of the communication tool.

A second stepwise multiple linear regression analysis was used to answer this research question. The same independent variables, perceived effectiveness of communication tool with patients and families and availability and dissemination of the communication tool were used in this analysis, with reasons why staff does not use the tool used as the dependent variable. Neither of the independent variables entered the stepwise multiple linear regression equation indicating they were not significant predictors of reasons why staff does not use the communication tool.

> *Research question 5.* Can the usage of the communication tool be predicted from staff characteristics, participation in early design, perceived strength and weaknesses, and perceived effectiveness?

The usage of the communication tool was used as the dependent variable in a stepwise multiple linear regression analysis. The independent variables in this analysis included: frequency with which communication tool was used, unit worked on, job category, time in health care, time in Beaumont, type of patients serviced, type of patients with whom the communication tool is used, frequency working with noncommunicative patients, participation in development of communication tool, content of communication tool, physical and structural aspects of the communication tool, visuals and drawings, text

included in communication tool, use with patients and families, and availability and dissemination. The variables were entered in groups by type. As a result, some variables that were statistically significant when they entered the stepwise multiple linear regression analysis, but in successive steps, the variables were no longer statistically significant. These variables are presented on the table as they are a part of the overall results. The findings of these analyses are presented in Table 15.

Table 15

Stepwise Multiple Linear Regression Analysis – Use of Tool with Staff Characteristics, Participation in Early Design, Perceived Strength and Weaknesses, and Perceived Effectiveness

Independent Variable	Constant	b Weight	Beta Weight	r^2	t-value	Sig of t
Visuals and drawings	1.53	.09	.14	.35	1.27	.207
Content of communication tool		.05	.08	.09	.74	.460
Text included in communication tool		.15	.18	.04	1.76	.082
Use with patients and families		.39	.48	.09	4.04	<.001
Multiple R						.76
R^2						.57
F Ratio						25.00**
DF						4/75

**p≤.01

Four independent variables; visuals and drawings, content of communication tool, text include in communication tool, and use with patients and families; entered the regression equation, explaining 57% of the variance in use of the communication tool. The associated F ratio of 25.00 was statistically significant at an alpha level of .05 with 4 and 75 degrees of freedom. This result indicated that the four independent variables as a group were explaining a significant amount of variance in use of the communication tool.

One of the four independent variables that entered the stepwise multiple linear regression analysis was found to be statistically significant at the completion of the

analysis. Use of the communication tool with patients and families explained 9% of the variance in use of the communication tool. The t-value of 4.04 obtained for this independent variable was statistically significant at an alpha level of .05. This variable had the highest beta weight ($\beta = .48$) among the four variables indicating it was the strongest predictor of use of the communication tool.

Visuals and drawings, content of communication tool, and text included in the communication tool originally entered the regression equation as significant predictors of use of the communication tool, but during subsequent steps, were no longer statistically significant. The remaining independent variables did not enter the regression equation indicating they were not significant predictors of use of the communication tool.

A second stepwise multiple linear regression analysis was completed using reasons why the communication tool is not used as the independent variable. The same groups of independent variables were used in this analysis. Table 16 presents the results of this analysis.

Table 16

Stepwise Multiple Linear Regression Analysis – Reasons for Not Using Tool with Staff Characteristics, Participation in Early Design, Perceived Strength and Weaknesses, and Perceived Effectiveness

Independent Variable	Constant	b Weight	Beta Weight	r^2	t-value	Sig of t
Communication tool used by other types of patients	1.95	-1.54	-.33	.15	-3.18	.002
Communication tool used by intubated patients		.49	.32	.10	3.15	.002
Multiple R						.50
R^2						.25
F Ratio						12.23**
DF						2/74

**p≤.01

Two independent variables, communication tool used by other types of patients and communication tool used by intubated patients, entered the regression equation explaining 25% of the variance in reasons the communication tool is not use with patients. The associate F ratio of 12.23 was statistically significant at an alpha level of .05 with 2 and 74 degrees of freedom. Based on this finding, the two variables appear to be explaining a statistically significant amount of variance in reasons why the communication tool is not used.

The first independent variable that entered the regression equation was communication tool used by other types of patients. This independent variable explained 14% of the variance in reasons why the communication tool was not being used. The t-value of -3.18 was statistically significant at an alpha level indicating this independent variable was a significant predictor of the dependent variable. The negative relationship between the two variables indicated that respondents who did not use the communication tool with other types of patients were more likely not to use the communication tool.

The second variable that entered the regression equation was communication tool used by intubated patients. This independent variable accounted for an additional 10% of the variance in reasons why the communication tool is not used. The obtained t-value of 3.15 was statistically significant at an alpha level of .05, with this result indicating that use of the communication tool was a significant predictor of reasons why the communication tool was used. The positive value of the relationship indicated that respondents who used the communication tool with intubated patients were more likely not to use the communication tool.

The remaining independent variables did not enter the regression equation, indicating they were not significant predictors of reasons why the communication tool is

not used.

Summary

This chapter has presented the results of the data analysis that were used to describe the sample and answer the research questions posed for this study. The conclusions and recommendations that can be drawn from these findings are presented in Chapter V.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

In the hospital environment, many patients cannot communicate, either verbally, in writing or through sign gestures. They cannot communicate any of their needs, either medical, physical or emotional, to hospital staff or relatives. These noncommunicative patients can be found in all areas of the hospital.

They cannot communicate for a variety of reasons. They may have special breathing or feeding tubes in their throats, or tubes or monitors on their arms, or they may have speech problems due to stroke or "closed head injury." They may also have hearing and vision problems, because of illness or age. They may be hearing impaired.

In addition to patients not being able to communicate with staff and families, the hospital staff and family members also cannot communicate their needs, questions and concerns to the patient. This lack of two-way communication can make it difficult for the medical staff to give high quality care.

Patient populations with communication problems fall into several categories: non-English speaking patients, patients in critical care units (CCUs), also called intensive care units (ICUs), or Acute Care Areas, and patients in rehabilitation areas.

Given the perceived unmet communication needs of patients, the Nursing Department of William Beaumont Hospital investigated the situation and the result was the establishment of a "Language Task Force" to identify specific needs and possible solutions. The Task Force felt that a basic visual communication tool was needed, a "Beaumont Communication Tool," to meet the physical and emotional needs of the patients, as well as the needs of families and nursing staff. A systematic problem-solving

approach to the development of the communication tool was utilized from the outset.

Formative evaluations have been performed on an ongoing basis with the Communication Tool being refined based on the feedback of the nursing staff. The tool has been pilot tested throughout the hospital, focusing on patient care areas, including both medical and surgical nursing areas and rehabilitation areas. Survey responses and interviews led to communication tool development and refinement over a period of several years. Based on these results, a number of suggestions were drawn that led to further development of the tool.

Based on the information gathered through needs assessments, surveys, feedback, revisions, the researcher created the visuals called for as well as the text portions and the fill-in forms to make the tool easily individualized by the patient. The researcher selected the format, scale, size, binding, paper and quantities to be printed, so as to make the product the most cost-effective.

Diffusion of the Communication Tool became an issue not long after the initial distribution of the first version, but particularly in the past year, since there has been a substantial decrease in the demand for the Tool. Some staff members reported that the tool was not being used on their unit, but they did not know why. Upon some on-site investigation, it was observed that some tools were being stored in the back of file cabinets, or the units had run out and not reordered. The problem of diffusion of an educational product in a large health care environment has been one component addressed in this study.

Purpose of the Study

This study examined the usage (diffusion) of the communication tool, as part of a formative evaluation, to determine who is using the communication tool, perceptions of

strengths and weaknesses of the communication tool, and perceptions of the effectiveness of the communication tool in facilitating communications with nonverbal patients.

Issues in Patient-Nurse and Nurse- Patient Communication

A variety of factors and issues have historically combined to make the topic of patient-nurse and nurse-patient communication an important research area within nursing. While a large body of literature emphasizes the importance of communication in caring for patients, much of the literature on nurse-patient communication has been critical of the quality and quantity of nurse-patient communication (Ashworth, 1984, 1985; Bergbom-Engberg & Haljamae, 1988, 1989; Dowden, Honsinger &Beukelman, 1986; Macleod-Clark, 1988; Menzel, 1997).

Conversations with patients have generally been described as friendly, but stereotyped; superficial; short in duration; and controlled and manipulated by nurses who tended to initiate communication, restrict the course and topics of conversations, and end communication when they chose. Patients have described the communication as one-way, from nurse to patient. Communication also tended to occur during the physical care of the patient, with conversations focused on physical care issues, nursing instructions, and explanations of procedures. Rarely did discussions involve issues of feelings, or personal issues such as families or emotional needs.

Time Limitation and the Physical Care of Patients

While research has acknowledged the general difficulties of communication, some research has emphasized the need to make time for patients. Being too busy and not having sufficient time to talk with patients is frequently offered by nurses as a reason for the low quantity and quality of nurse-patient communication. However, some research indicates that nurses do not always use quiet, less busy periods to talk with patients

(Macleod-Clark, 1988; Menzel, 1997).

Control of Communication

Research has described nurses as controlling nurse-patient communication by either discussing safe topics, such as physical care, or by avoidance of the patient. Macleod-Clark (1988) demonstrated that the majority (83.5%) of nurse-patient communication was initiated by the nurse rather than the patient. Nurses' interactions with patients, through verbal and visual communication, are brief, predominantly task-centered, and concerned with physical care. Nurses seem to restrict communication to those interactions which are necessary for the patient's progress through the department. Some researchers suggest that blocking and avoidance techniques employed by nurses may be consequences of inadequate verbal skills.

Communication Theories

Richey (1986) has described communication theory as being influenced by both general systems theory and information processing. Communication has been viewed as a system with the primary components being a message "source," usually a human being, the "channel" who "encodes," and the message "receiver" who "decodes" the message and attaches meaning to it. The channel can be viewed as a delivery system, the medium or vehicle of message transmission (Schramm, 1977).

Communication Models

Many information and communications theorists have devised models to explain the way the communication process functions. Since the 1940s, several models of communication have been developed, including the process of interpersonal or organizational communication, focus on audiences, and means of transmission. Some models are simple, one way and linear, while others are complex with interconnections

and feedback loops, nonlinear and almost three-dimensional. Each of the models is graphically represented in Appendix A.

A simple early model developed by Laswell in 1948. He described the basic elements of communication as "Who says what in which channel to whom with what effect?" (Moore & Dwyer, 1994, p. 88). Another early model of communication developed by Shannon and Weaver in 1949 defined communication as a one-way linear process and their model reflected this thinking (Shannon & Weaver, 1949). A unique feature in the Shannon-Weaver model is the concept of "noise." The "noise source" may alter the signal which may mean that the message arriving at the destination is not the exact one sent from the information source. According to Shannon and Weaver, noise is one reason that communication fails. Another influential model, developed by Schramm (1954), showed that communication was endless, not something that began in one place and ended in another. Schramm's model differed from other models in that he included "fields of experience" between the sender and the receiver.

A linear model that focused on the characteristics of the sender and receiver was developed by Berlo (1960). Berlo identified characteristics of both sender and receiver as being comprised of communication skills, attitudes, knowledge, social system, and culture, and was "a model of the ingredients in communication" (p. 24).

Human Communication: A Multi-channel Phenomenon

Human communication is multi-channel, involving both verbal and non-verbal methods. A channel is any route by which communication occurs, e.g. speech-hearing (vocal-auditory), or visual-gestural(gesture-sight), or physical contact or touch. While verbal communication is often the one channel preferred, situations arise where more emphasis needs to be placed on visual and symbolic channels of communication

According to Ashworth (1980), in a normal two-person conversation, verbal components convey less than 35% of the social meaning of the situation, while more than 65% is conveyed by non-verbal channels. Where verbal and nonverbal messages are inconsistent the non-verbal message is usually dominant.

Most interaction research in nursing is concerned with patients who are able to talk or at least communicate in some way. According to Ashworth (1980), little work has been done on simultaneous verbal and non-verbal communication. The multi-channel interaction phase of communication might include verbal and vocal behavior, in both style and content; posture, position and physical movements, or body language; bodily contact or touch; facial expression and eye behavior.

In the health care environment, and in particular in the intensive care areas where verbal communication may not be an option for the intubated patient, nurses may need to find ways to communicate through a variety of techniques. These communication techniques may include:

- pencil and paper, with the assumption that the patient can see clearly and read
- the "Magic Slate," also assumes patient can read and write, and is not paralyzed
- tracing words on surface, assumes patient can write; hand signals, can be easily misinterpreted
- American sign language, requires knowledge of language
- the "Alphabet Board" assumes patient can spell; may be tiring; Flash cards, requires the ability to see and choose, be selective, and have many cards
- the use of several types of computers, designed for the patient with speech and cognitive disorders, often used in rehabilitation areas, but could also be at bedside.

While the present study examined one alternative channel, other channels should

also be examined. As new communication technologies develop, it is likely that even more innovative means for interacting in the health care environment will emerge. These too should be systematically examined for their effectiveness.

The Systems Approach and Models of Instruction

The term *systematic* has been defined by Seels and Richey as "Using processes or step-by-step procedures that allow one to create systems composed of interrelated, interwoven elements that together constitute a whole." (Seels & Richey, 1994, p. 133). Gustafson (1991) used the term "systems approach" interchangeably with other terms, such as: instructional development, instructional systems development, instructional technology, and educational design. The Dick and Carey Model (1996) is a classic model of instruction. This model has many things in common with other models. They begin with a needs assessment, identify the target audience and audience characteristics, objectives, and evaluation processes to measure effectiveness. While different designers may have unique terminology for steps in their models, the overall design and system are similar. Another classic model, Interservice Procedures for Instructional Systems Development (IPISD), was developed by Branson (1981). Branson's model is a conceptual framework which is organized into five broad phases, or stages, each with a number of subphases. The Phases include Analyze, Design, Develop, Implement and Control.

Formative Evaluation

Scriven (1967) identified different roles of formative and summative evaluations, terms now universally accepted in the field of instructional design (Worthen & Sanders, 1987). Formative evaluation is conducted during the operation of a program to provide program designers, managers, or directors evaluative information that can be used to

improve the program. More than 90% of models in the instructional design literature include formative evaluations as a necessary element (Andrews & Goodson, 1980).

Diffusion

In the late 1960s, the concept of "diffusion of innovations," was introduced. Rogers (1994) defined diffusion as the spread, adoption, and maintenance of an innovation, and later as the process by which an innovation is communicated through certain channels, over time, among members of a social system. Briggs (1977) included diffusion as part of his instructional design model, beginning with the design phase and continuing through the formative evaluation phase. Seels and Glasgow (1990) included "Dissemination and Diffusion" as the last stage in their instructional design model titled: Project management (Gustafson, 1991).

Utilization

Utilization has been defined as "the act of using processes and resources for learning" (Seels & Richey, 1994, p. 134). The term is often interchanged with usage, dissemination, diffusion or implementation. Burkman (1987) has stated "implementation is defined as putting the program into use" (p. 435). While many models exist for designing instruction and instructional products, the design process often functions poorly when the product is to be implemented under real world conditions (Back & McCombs, 1984; Butler, 1982). Rogers, through his ground breaking work in diffusion of innovations, made important contributions to the area of utilization because utilization depends on the promotion of awareness, trial, and adoption of innovations.

Visual Literacy

Literacy and visual literacy have been closely linked and often definitions of the terms overlap each other. "Today literacy is the skills with which man manipulates the

many media of mass communication" (Postman, 1971, p.26). Feldman (1976) raised a number of questions regarding differences between "reading" and understanding visuals. Visual literacy not only involves "reading" visual images, and using and creating visuals, but more importantly, it is a method or process for thinking. Although many disciplines have contributed to knowledge and understanding of visual literacy, almost all major concepts of visual literacy can be traced to four areas of study: linguistics, art, philosophy, and psychology (Barley, 1971; Debes, 1969).

Methods

A nonexperimental, correlational research design was used in this study to determine the strength and direction of the relationships between the use of the communication tool and staff characteristics, staff participation, and perceived strengths and weakness of the communication.

The study was conducted at a large suburban hospital with 1,000 beds. The population included medical personnel who were directly involved in caring for noncommunicative patients. These medical personnel included registered nurses, physical and occupational therapists, physical and occupational therapy assistants and aides, respiration therapists, speech therapists, and direct care nursing assistants. A purposive, nonrandom sample was used for this study. The employees who worked on the units that were included in this study were sent a presurvey that asked if they worked with noncommunicative patients and if they had used the Beaumont Communication Tool. If they answered affirmatively to both questions they were asked to complete the survey. A total of 135 employees was included in the sample. Of this number, 45 had not used the communication tool and were eliminated from the study. The research questions were based on the responses of the remaining 90 employees.

An original survey was developed for this study. The survey included seven sections: professional characteristics, patient characteristics, participation in development of communication tool, perceived strengths and weakness of communication tool, availability and dissemination of communication tool, reasons to use the tool, and reasons the communication tool should be used. The instrument was reviewed by hospital personnel and was considered to have content validity.

Findings

The participants either used the communication tool infrequently or monthly, with some employees indicating they used it weekly. The largest group of healthcare providers indicated they worked with general patients including stroke, while the second largest group were assigned to medical/surgical intensive care units. The majority of the respondents were nurses. The respondents had been in health care for an average of 12.43 (sd=9.35) years and at Beaumont Hospital for a mean of 7.91 (sd=6.49) years.

The types of patients with whom the participants in the study worked included stroke patients, intubated patients, non-native speakers of English, cancer patients, cardiac patients, hearing impaired, head injured, and rehabilitation patients. They used the communication tool with intubated patients, stroke patients, non-native speakers of English, and hearing impaired patients. Most of the respondents indicated they worked with noncommunicative patients on a daily basis. Less than 20% of the respondents reported they had helped in the development of the communication tool.

Research Questions

Five research questions were posed for this study. Each of these questions were answered using stepwise multiple regression equations and Pearson product moment correlations. All decisions on the statistical significance of the findings were made using

an alpha level of .05.

> *Research question* Is there a relationship between staff characteristics such as unit, nature of patients, position on staff, experience with noncommunicative patients, and the staff's use of the communication tool (diffusion)?

Unit, time in health care, time at Beaumont Hospital, type of patients treated by staff, and type of patients with whom the communication tool has been used were used as independent variables in a stepwise multiple linear regression analysis. The reasons why communication tool is used was the dependent variable in this analysis. None of the independent variables entered the regression equation, indicating they could not be used to predict use of the communication tool.

The reasons why the tool was not used was the dependent variable in a second stepwise multiple linear regression analysis. The same set of independent variables were used in this analysis. Two independent variables, staff uses communication tool with other types of patients and staff uses communication tool with intubated patients were significant predictors of reasons why staff does not use the communication tool with noncommunicative patients.

> *Research question 2.* Is there a relationship between the staff's early participation in the development and design of the communication tool, and the staff's use of the tool?

Most of the participants in the study had not participated in the development and design of the communication tool. As a result, this question could not be answered.

> *Research question 3.* Is there a relationship between perceived strengths and weaknesses of the communication tool, and the use of the tool?

A stepwise multiple linear regression analysis was used to determine which of the independent variables (content of communication tool, physical and structural aspects of the communication tool, text included in communication tool, visuals and drawings) could be used to predict use of the communication tool. The results of this analysis

indicated that three independent variables (perceptions of the text included in the communication tool, content of communication tool, and visuals and drawings) explained a statistically significant amount of variance in use of the communication too. These three variables could be used to predict use of the communication tool.

The same independent variables were used to determine if they could predict why the communication tool was not being used. None of the independent variables entered the stepwise multiple linear regression analysis, indicating they were not significant predictors of why the communication tool was not being used.

> *Research question 4.* Is there a relationship between the perceived effectiveness of the communication tool with patients and families, and its use by the staff?

Perceived effectiveness of the tool with patients and families and availability and dissemination of the tool were used as independent variables in a stepwise multiple linear regression analysis. The use of the communication tool was used as the dependent variable in this analysis. Perceived effectiveness of tool with patients and families entered the regression analysis, explaining a significant amount of variance in the use of the tool.

A second stepwise multiple linear regression analysis was used to determine which of these independent variables could be used to predict why the communication tool was not used. The results of this analysis indicated that none of the independent variables could be used to predict why the communication tool was not being used.

> *Research question 5.* Can the usage of the communication tool be predicted from staff characteristics, participation in early design, perceived strength and weaknesses, and perceived effectiveness?

The usage of the communication tool was the dependent variable in a stepwise multiple linear regression analysis. The independent variables in this analysis included: frequency with which communication tool was used, unit worked on, job category, time

in health care, time at Beaumont, type of patients serviced, type of patients with whom the communication tool was used, visuals and drawings, text, use with patients and families, and availability and dissemination. The results of this analysis showed visuals and drawings, content of communication tool, text included in communication tool, and use with patients and families could be used to predict usage of the communication tool.

The same independent variables were used in a second stepwise multiple linear regression analysis to determine if they could predict why the communication tool was not being used. The results of this analysis showed that communication tool use by "other types of patients" and communication tool use by intubated patients could be used to predict the nonuse of the communication tool. The negative relationship between communication tool use by other types of patients and reasons for not using the tool indicated that staff members who used the tool with other types of patients were more likely not to use the tool with any patients.

Conclusions

Staff characteristics were not found to be predictors of use of the communication tool with noncommunicative patients. A review of the demographic characteristics indicated that the tool was being used infrequently by the staff. They may not have been sufficiently familiar with the tool to use it with their patients, although most of the staff indicated they worked regularly with noncommunicative patients. The tool being used with "other types"of patients and with intubated patients may have resulted in staff becoming frustrated with the lack of effectiveness, since "other types" and intubated patients may not have been appropriate patient types with whom to use the tool. "Other types" and intubated patients may have included elderly, very ill and unresponsive

patients, or heavily medicated patients, therefore discouraging the staff from further use of the tool. Therefore, the unsuccessful use of the tool with "other" patients and intubated patients could be an indicator of why the tool would not be used by staff members in the future.

The lack of participation in the development of the tool may also have played a role in the lack of familiarity and lack of consistent usage of the tool. Although numerous educators were surveyed on a continuous basis during the development stages of the communication tool, they may not have been the ones who actually used the communication tool at the bedside. Also, the educators who helped in the development of the communication tool also may have been the ones who pilot-tested the instrument and, therefore, were not included in the final survey. Other employees who participated in the formative evaluations may not have participated in the present study for a myriad of reasons: they may have left the organization, they may have been educators who participated in initial development but do not have direct patient care, they may have transferred from the units where they worked during the pilot study, or they were unavailable at the time the surveys were distributed on their units (e.g., vacation, leave of absence, etc.).

Text, content, and visuals and drawings were all indicators of increased usage of the tool and could be predictors for the use of the tool. The results of the survey indicated that the staff found these variables to be positive elements leading to use of the tool. The tool was also found to be effective with patients and families and was a predictor for future use.

While the findings seem to indicate that the staff found the communication tool well done in terms of text, content, visuals and even effectiveness, the findings also show

that the tool was not used as often as it may have been used, given the initial requests and needs assessments. Documentation of tool usage showed that once the supply of communication tools on a particular unit was depleted, by giving them to patients and families, few efforts were made to obtain more copies. Communication tools that were in the units often were stored away in drawers or areas not trafficked and then forgotten by staff. Occasionally, professional staff members who used the communication tool were transferred and other members on the unit failed to use the tool for various reasons, such as lack of knowledge about the tool, where it was stored, or how to reorder the tool when supplies were depleted. It must be remembered that activities in hospital settings take place in a context of tension and anxiety, with nurses having great strain put upon them by the patient workload. It is often easier to ignore a patient with communication needs, than to try to find a hidden communication tool.

Implications for Instructional Technology

This research study has demonstrated that it is not enough to carry out a needs assessment, develop objectives, design and develop an educational product, conduct formative evaluations, and in the end create a communication tool that meets the identified needs on noncommunicative patients. Educational products must constantly be promoted on the units that have these needs so that the end users, the staff, patients, and their families, will be reminded that the tools exist and are available for use. The end users, for a variety of reasons, may not have participated in the development of the educational product, may not be familiar with it, may not have been trained in its usage, may have developed other methods to communicate with noncommunicative patients, or may not have had the time to find out where it was stored or how to get one if the

supplies on the unit were depleted.

There are many reasons why people, in this case nurses and ancillary medical professionals, do not take advantage of educational products that educators and designers feel are in their best interest: conditions on the unit; stress of providing medical services to needy patients; low staffing levels; time-constraints; misplacing the communication tool; forgetting it exists or finding alternative methods to communicate; failing to communicate; or either ignoring the patient or giving as little feedback as possible, under the guise of being "too busy."

For the educator and designer these roadblocks, or obstacles to usage, can be seen as possible problems in the areas of implementation, availability, dissemination, diffusion, marketing, distribution, or simply a lack of proper "training." A major concern of developers of educational products is getting the end user to use it. On-going follow-up may be necessary to assure that nurses and ancillary medical personnel are both aware of the tool and understood its use with noncommunicative patients. Strategies should be found and used to ensure that all the reasons (barriers) why educational products are *not* used are identified, and then eliminate the barriers and obstacles to usage.

A possible intervention on the part of the designer or design team may be to involve the audience/clients in all developmental steps of the educational product, or actively involve the staff in tool development, from the very beginning of the process. For a product that requires extensive time to develop, it is important to plan for turnovers of subject matter experts (SMEs) and staff, as well as the need to educate new team members, and make sure all departments (hospital units) continue to be represented in the development team.

In addition, the designer may need to monitor usage of the tool in a methodical

way. Careful records might be kept of how many tools are used, in which areas. In this way, the designer can begin to predict which departments are using what quantities and if there is change in a pattern, that would alert the designer about a possible problem in diffusion or distribution.

Instructional designers of educational products in a healthcare settings need to understand the importance of involving upper level nursing management and "get their blessing" for the project. If upper level directors approve the project enthusiastically, they generally "pass it down" and lower level managers (nurse managers, assistant nurse managers) and unit staff then see using the educational product, or new innovation, as a priority.

An additional strategy to improve utilization of an educational product is to promote ongoing staff training (nurse managers, assistant managers, unit staff) on benefits of using the communication tool with patients and families. The training should be systematic, practical, not theoretical, and use adult learning principles, which may mean keeping the training short, simple and practical. It might be emphasized during a training or orientation session that there are federal and state laws, and professional organization rules, policies and procedures which state clearly that patients, families and staff must be able to communicate with each other. One such federal legislation is the American Disabilities Act which is strictly enforced.

Recommendations for Further Research

Based on the findings and conclusions reached in this study, the following recommendations for further research should be considered to continue research into diffusion and utilization into new innovations that could be used to assist in promoting

communication with patients.

- Conduct a formative evaluation prior to offering training to determine what parts of the communication tool that staff members want changed, improved, or eliminated.

  Rationale: An additional formative evaluation may be needed to determine if there are changes that are needed and what areas that staff members may require training and direct the training to that need.

- Complete a training program for staff nurses, rehabilitation professionals, and others who work with noncommunicative patients to introduce the communication tool and show how the tool can be used effectively with this hospital population. Use a pretest and posttest to determine change in attitudes toward the tool and intent to use the tool with noncommunicative patients.

  Rationale: By attempting to understand the attitudes of nursing staff toward using the tool with noncommunicative patients, the success of the training program on motivating the use of the tool can be assessed. This assessment can help instructional designers develop training that is practical and useful.

- Investigate other educational products that have been developed to obtain information on why these products are being used/not used and methods that can be used to improve their diffusion to the general hospital population.

  Rationale: Instructional designers of healthcare educational materials need to be aware of the usage of their products with the groups for which they have been designed. Through the use of summative evaluations and other methods of determining usage (material control, surveys, etc.) the diffusion of educational materials requested by staff and nurse educators can be determined.

- Study the effects of use of the communication tool with noncommunicative patients on their satisfaction with the care they have received while hospitalized.

  Rationale: There is a need to determine if patient satisfaction is enhanced by the use of the communication tool during periods when they are unable to communicate due to their illness or language difficulties. If patients are satisfied with the communication tool, nurses and ancillary medical personnel may be encouraged to use the tool with other patients.

- Examine the development and implementation process used with the

communication tool to determine if additional needs assessments, formative evaluations, training programs, and reminders are needed when developing and disseminating new educational products successfully within the hospital.

Rationale: By reviewing development and implementation processes used with the communication tool, shortcomings to the systems method of instructional design can be examined, and additional developmental factors can be implemented to enhance acceptance and use of the communication tool.

Other areas that can be recommended for further research include:

- Investigate the staff who were rejected after receiving survey. These staff initially stated that they were familiar with the communication tool, but upon receipt of the survey, stated they had not used the tool and were eliminated from the study. Some of these participants may have been aware of the communication tool but did not use it. The question is why were they not using the tool.

- Study the differences and similarities between noncommunicative and nonEnglish speaking patients. Noncommunicative patients may not be able to communicate either verbally or otherwise, because of health problems that prevent speech, such as a stroke, or closed-head injury; while nonEnglish patients may be having health problems, but are unable to communicate in English.

- Study the use of Communication Tools developed for specific audiences, for example patients in Rehabilitation. Perhaps different units or departments in hospitals have special needs that are specific to their areas and not generic. The Communication Tool as designed may be effective in medical/surgical units, but not in rehabilitation departments.

- Examine the use of Communication Tool as marketing tool by sending it to selected patients before surgery. The tool may be useful in preparing patients who are going to have surgery that may cause a temporary loss of communication ability and help them become acquainted with the tool in a comfortable setting with members of their family.

- Compare nurses' attitudes and responses in each area of hospital (e.g., ICUs, Rehabilitation, Med/Surg Nursing) to determine if the Communication Tool is meeting the needs of the specific departments.

- Describe the discrepancy between examples and situations found in the literature and real world conditions. For example in the real world, conditions on the unit may be much more stressful and hurried than might be described in controlled conditions in which research may be conducted.

Summary

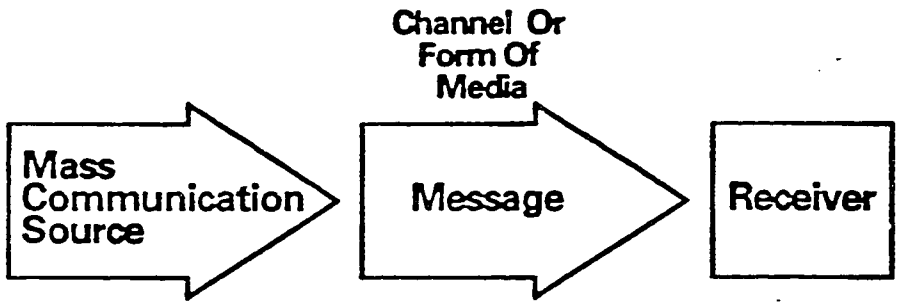
Chapter I has presented an overview of the study, including the statement of the problem, research questions, and definition of terms. The second chapter has provided a review of relevant research on noncommunicative patients, communication theory, and systems theory. The methods and procedures that were used to collect and analyze the data needed to describe the sample and answer the research questions were included in the third chapter. Chapter IV presented the results of the statistical analysis, with conclusions and recommendations provided in Chapter V.

APPENDIX A

COMMUNICATION MODELS

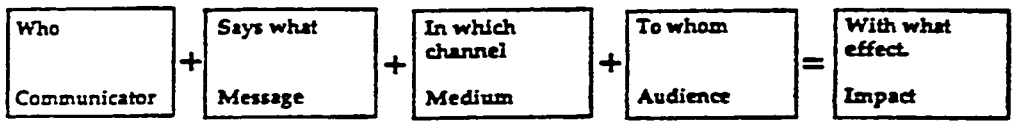
Aristotle's Model of Communication.

Wisely, F.G. (1994). Communication Models. In D.M. Moore & F.M. Dwyer, (Eds.), Visual literacy: A spectrum of visual learning. Englewood Cliffs, NJ: Educational Technologies.



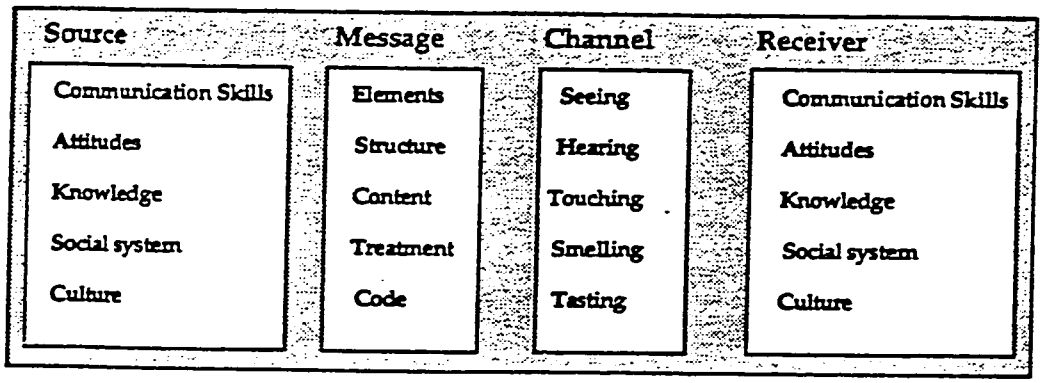
A Hypodermic Approach to Communication.

Saunders, A.C. (1994). Graphics and how they communicate. In D.M. Moore & F.M. Dwyer (Eds.), Visual literacy: A spectrum of visual learning. Englewood Cliffs, NJ: Educational Technology Publications.



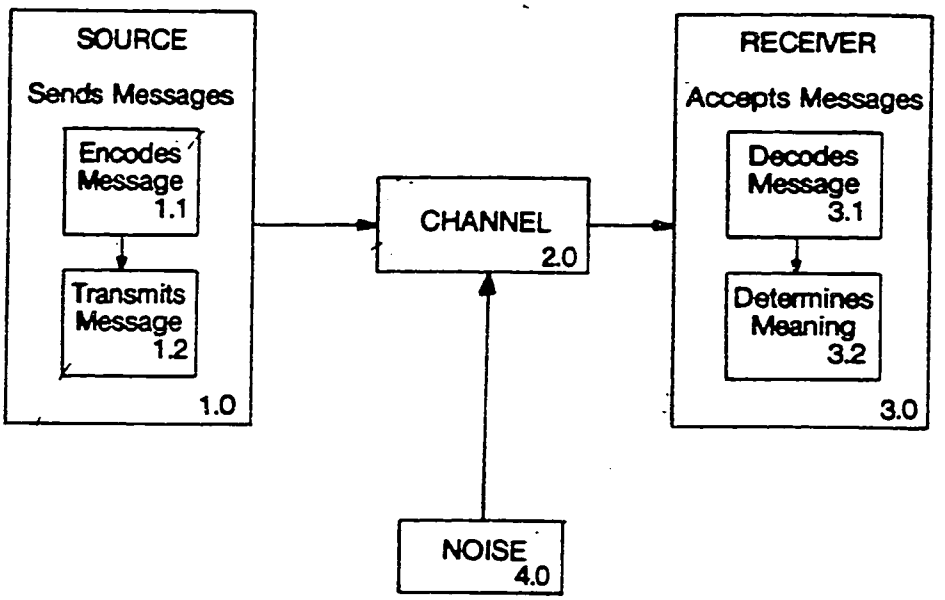
Laswell's Model of Communication.

Wisely, F.G. (1994). Communication Models. In D.M. Moore & F.M. Dwyer, (Eds.), Visual literacy: A spectrum of visual learning. Englewood Cliffs, NJ: Educational Technologies.

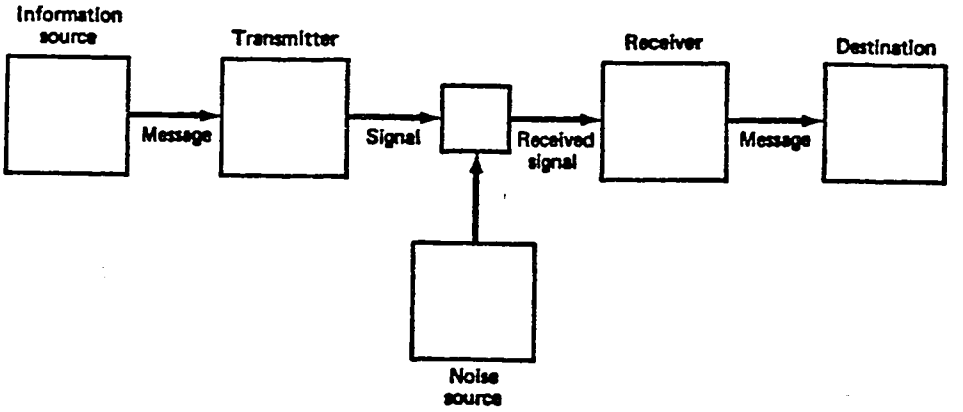


Berlo's Model of Communication.

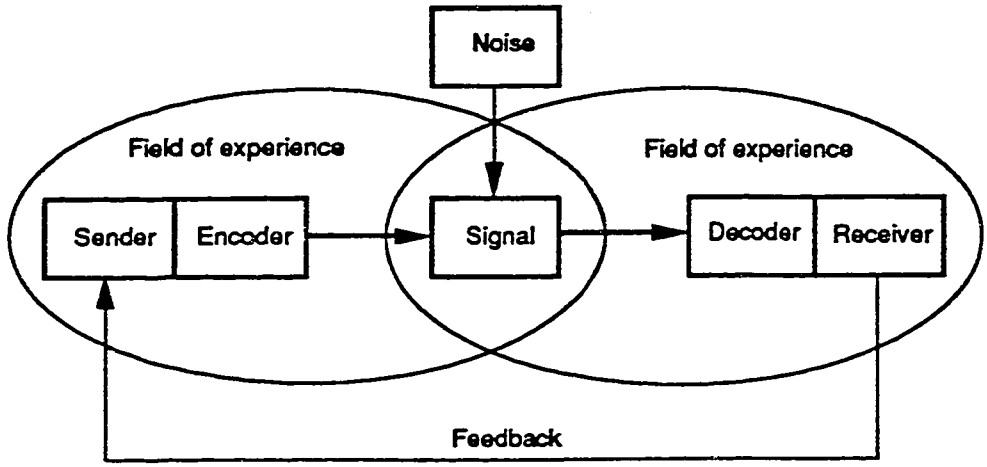
Berlo, D. (1960). The process of communication: An introduction to theory and practice. New York: Holt, Rinehart, and Winston.



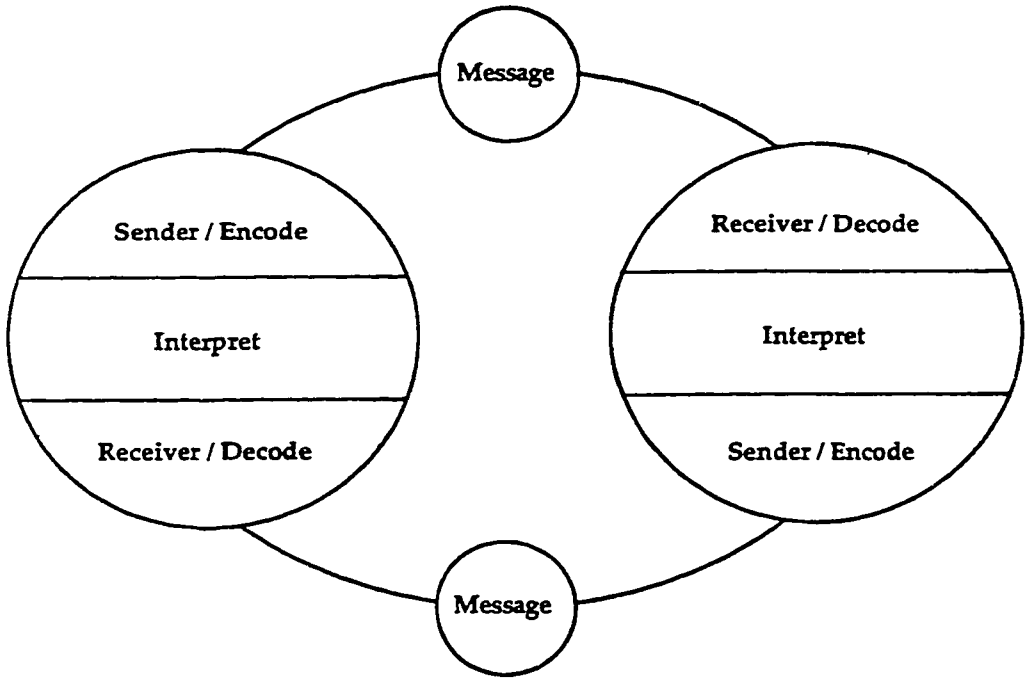
A Model of the Transmission of Messages. In Richey, R.C. (1990). The theoretical and conceptual bases of Instructional Design. London: Kogan Page.



Shannon-Weaver communication model. From Shannon, C.E., & Weaver, W. (1949). The mathematical theory of communication. Champaign: University of Illinois Press.



Schramm's (1954) adoption of the Shannon and Weaver communications model.



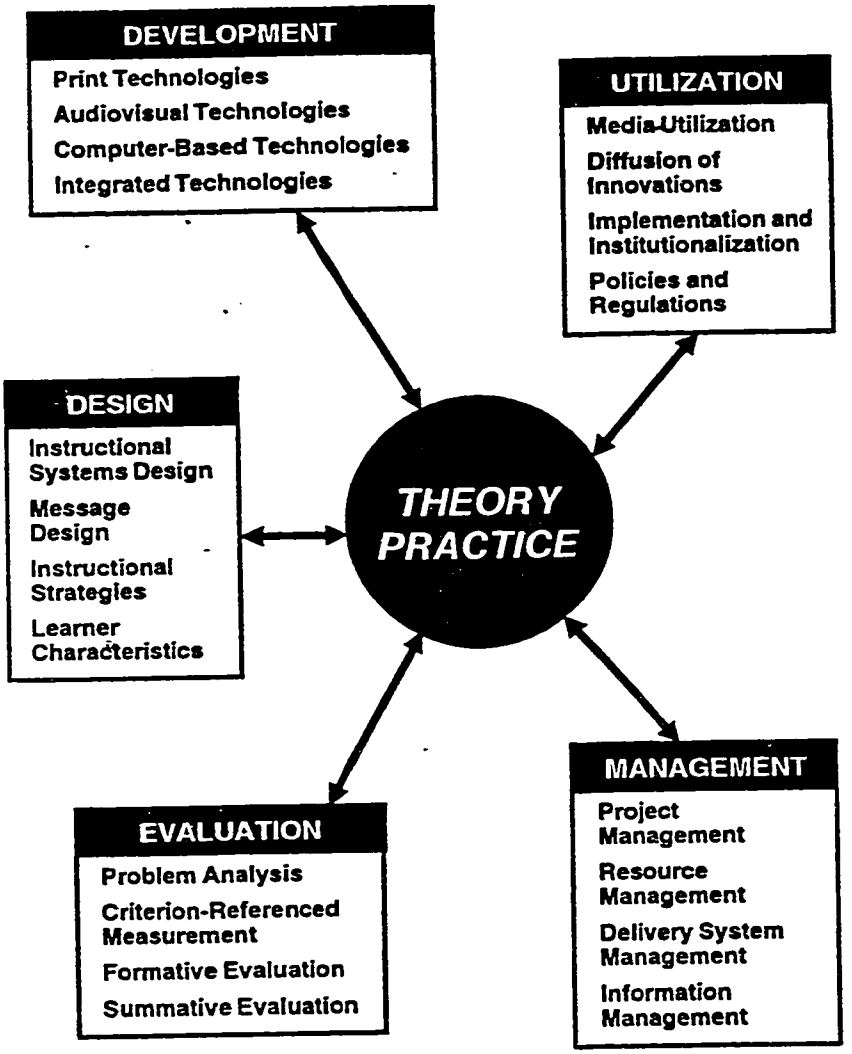
Schramm's Later Model of Communication.

Wisely, F.G. (1994). Communication Models. In D.M. Moore & F.M. Dwyer, (Eds.), Visual literacy: A spectrum of visual learning. Englewood Cliffs, NJ: Educational Technologies.

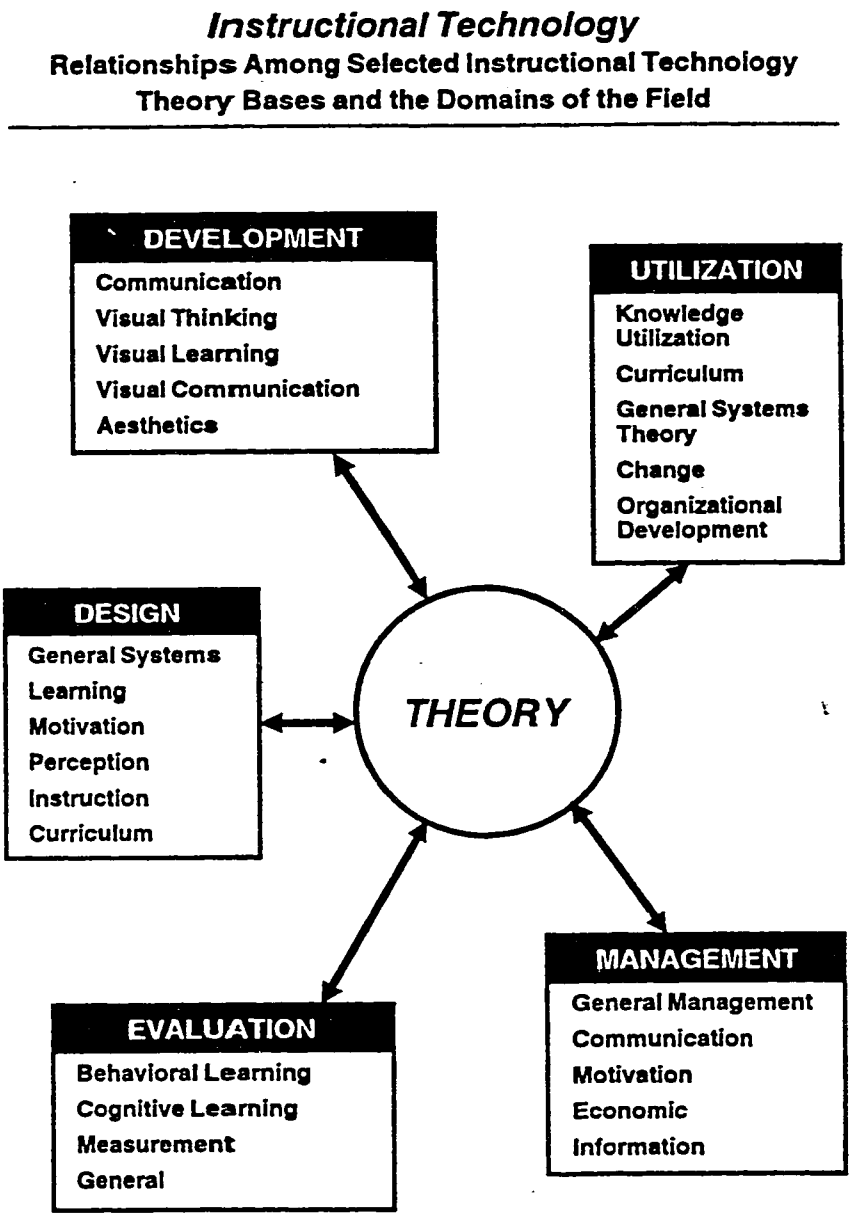
APPENDIX B

INSTRUCTIONAL DEVELOPMENT MODELS

The Domains of Instructional Technology



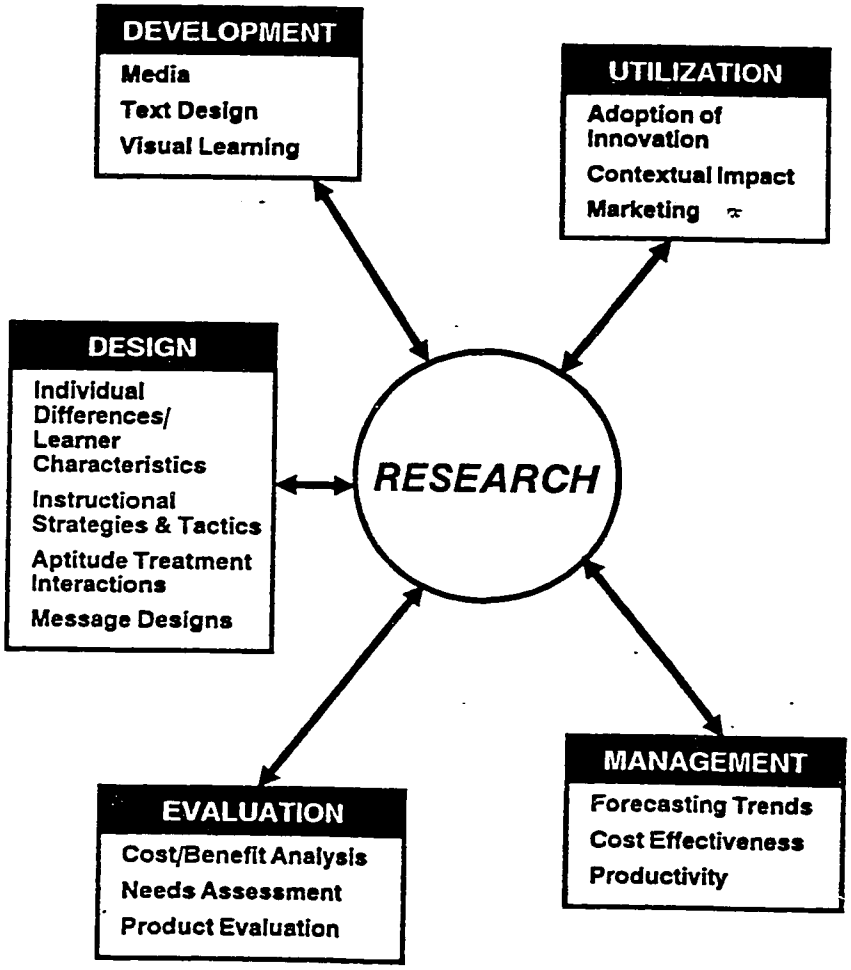
Seels, B.B. & Richey, R.C. (1994). Instructional technology: The definition and domains of the field. Washington, D.C.: AECT.



Seels, B.B. & Richey, R.C. (1994). Instructional technology: The definition and domains of the field. Washington, D.C.: AECT.

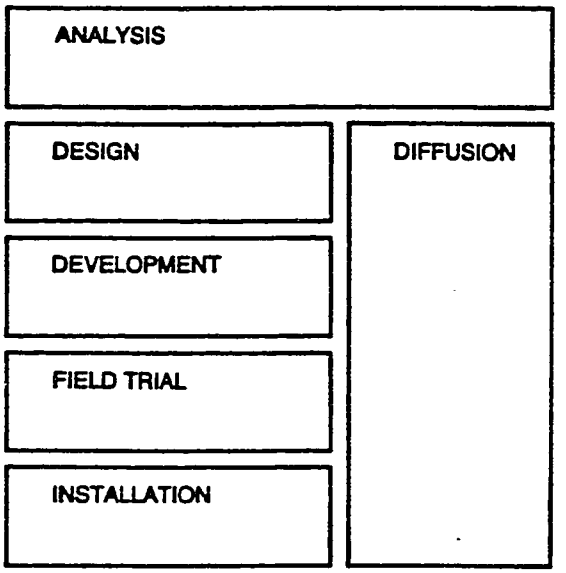
Instructional Technology

Relationships Among Selected Instructional Technology Research and the Domains of the Field



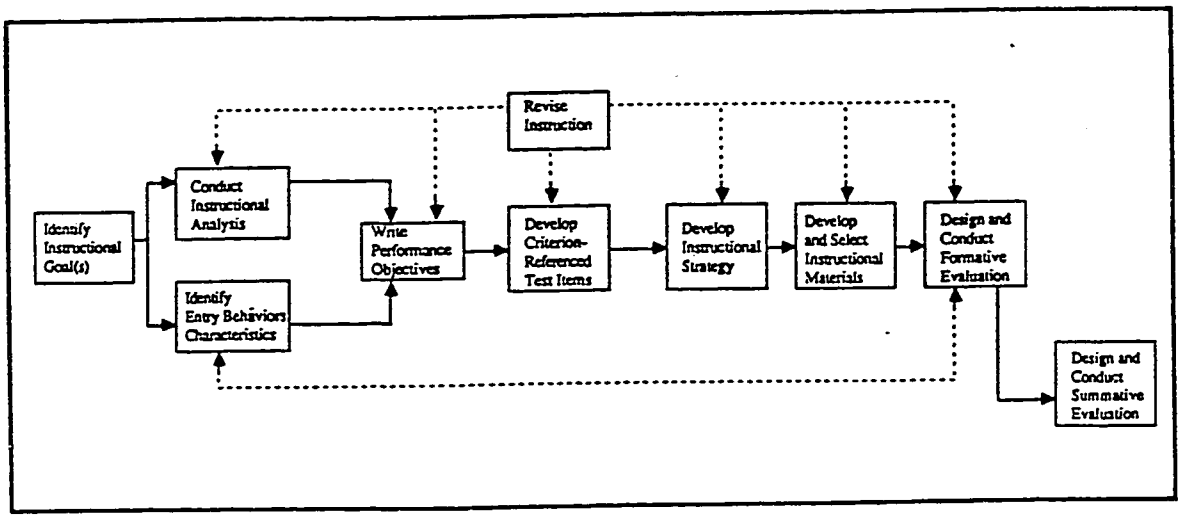
Seels, B.B. & Richey, R.C. (1994). Instructional technology: The definition and domains of the field. Washington, D.C.: AECT.

Briggs 1977 Model

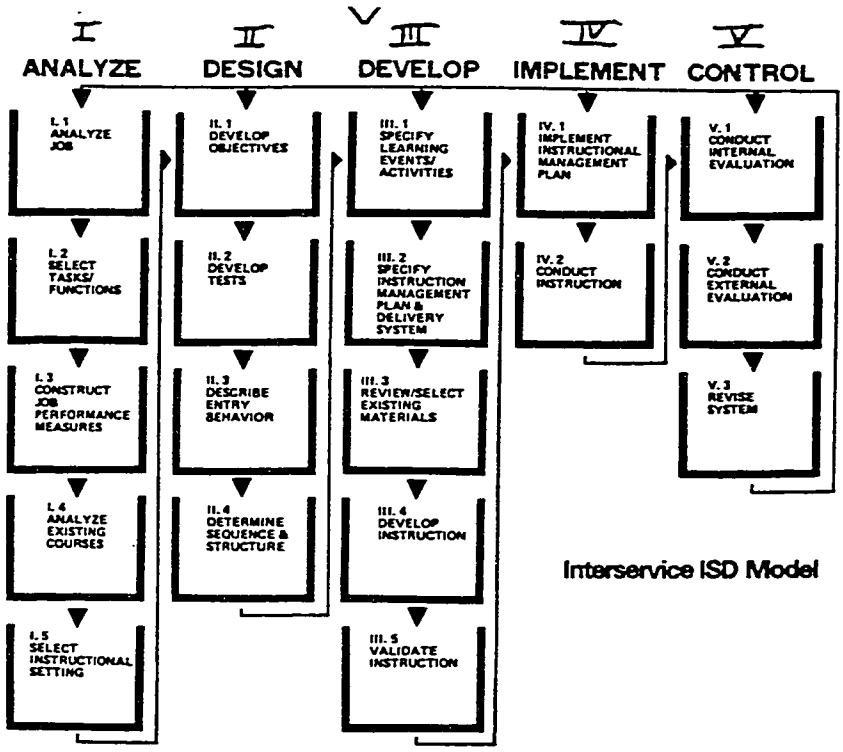


Briggs, L.J. (1977). Instructional design: Principles and procedures. Englewood Cliffs, NJ: Educational Technologies.

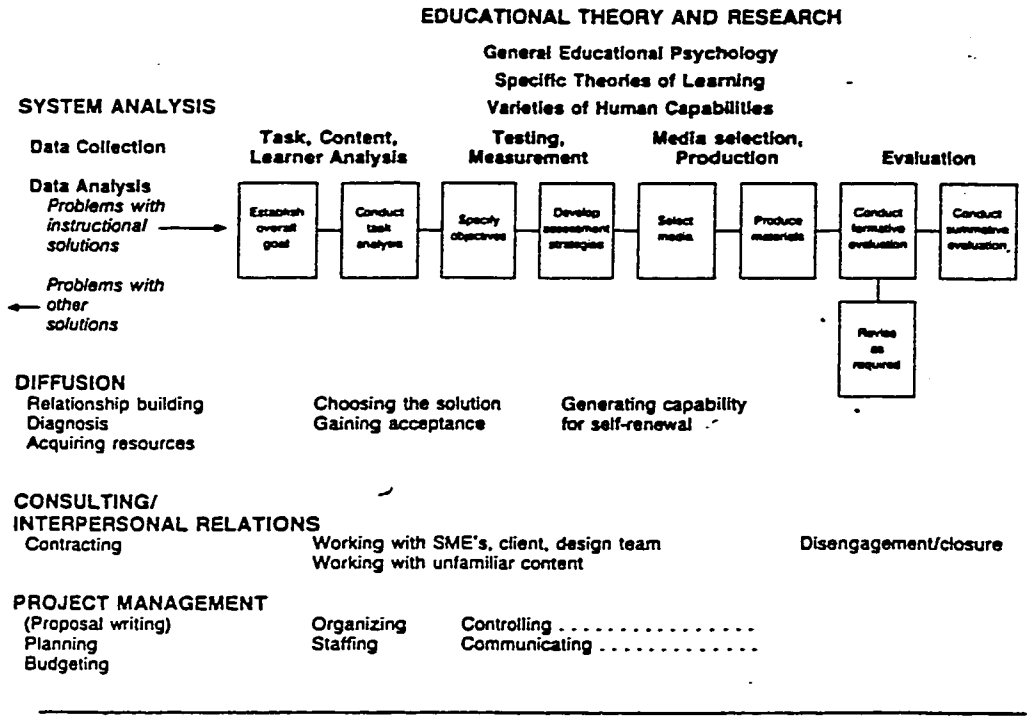
The Dick and Carey Systems Approach Model (from Dick & Carey, 1985)



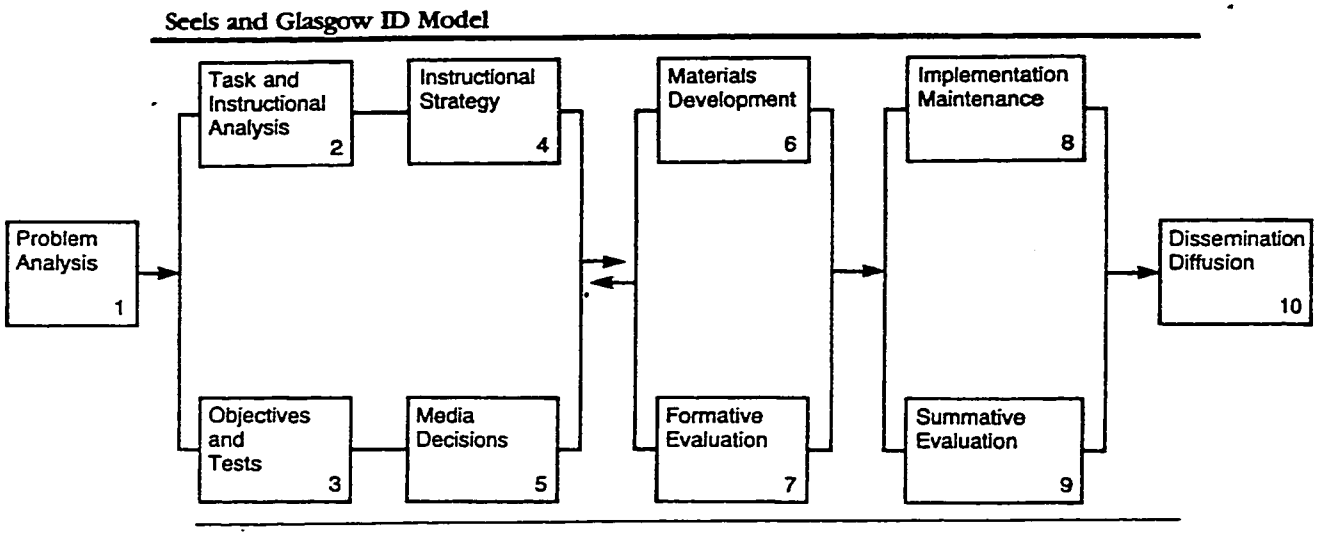
Dick, W., & Carey, L. (1996). The systematic design of instruction (4th Ed.). New York: HarperCollins.



The Model of Interservice Procedures for Instructional Systems Development (IPISD). Branson, R.K., & Grow, G. (1987). Instructional systems development, in R.M. Gagné, (Ed.), Instructional Technology: Foundations (pp.397-428). Hillsdale, NJ: Erlbaum.



Instructional systems design view. From Schiffman, S.S. (1986), Instructional systems design: five views of the field. Journal of Instructional Development, 9, 14-21



Seels, B.B., & Glasgow, Z.(1990). Exercises in instructional design. Columbus, OH: Merrill Publishing.

APPENDIX C

COMMUNICATION TOOL

COMMUNICATION TOOL

This communication tool is for you and your family to use when you are communicating with each other or with a health care worker. You can use it when you are in the hospital, at home or when you visit your doctor.

For additional copies, or revisions to meet individual needs please call 248-551-7460.

William Beaumont Hospital, Royal Oak, Michigan

707 JAN 98

MY FAMILY

	(English)	(My language)
Husband	_____	_____
Wife	_____	_____
Daughter	_____	_____
Son	_____	_____
Father	_____	_____
Mother	_____	_____
Sister	_____	_____
Brother	_____	_____
Nephew	_____	_____
Niece	_____	_____
Friend	_____	_____

MY DOCTOR'S APPOINTMENTS

(English) day date time	(My language)

DIRECTIONS

DON'T SPEAK DON'T EAT

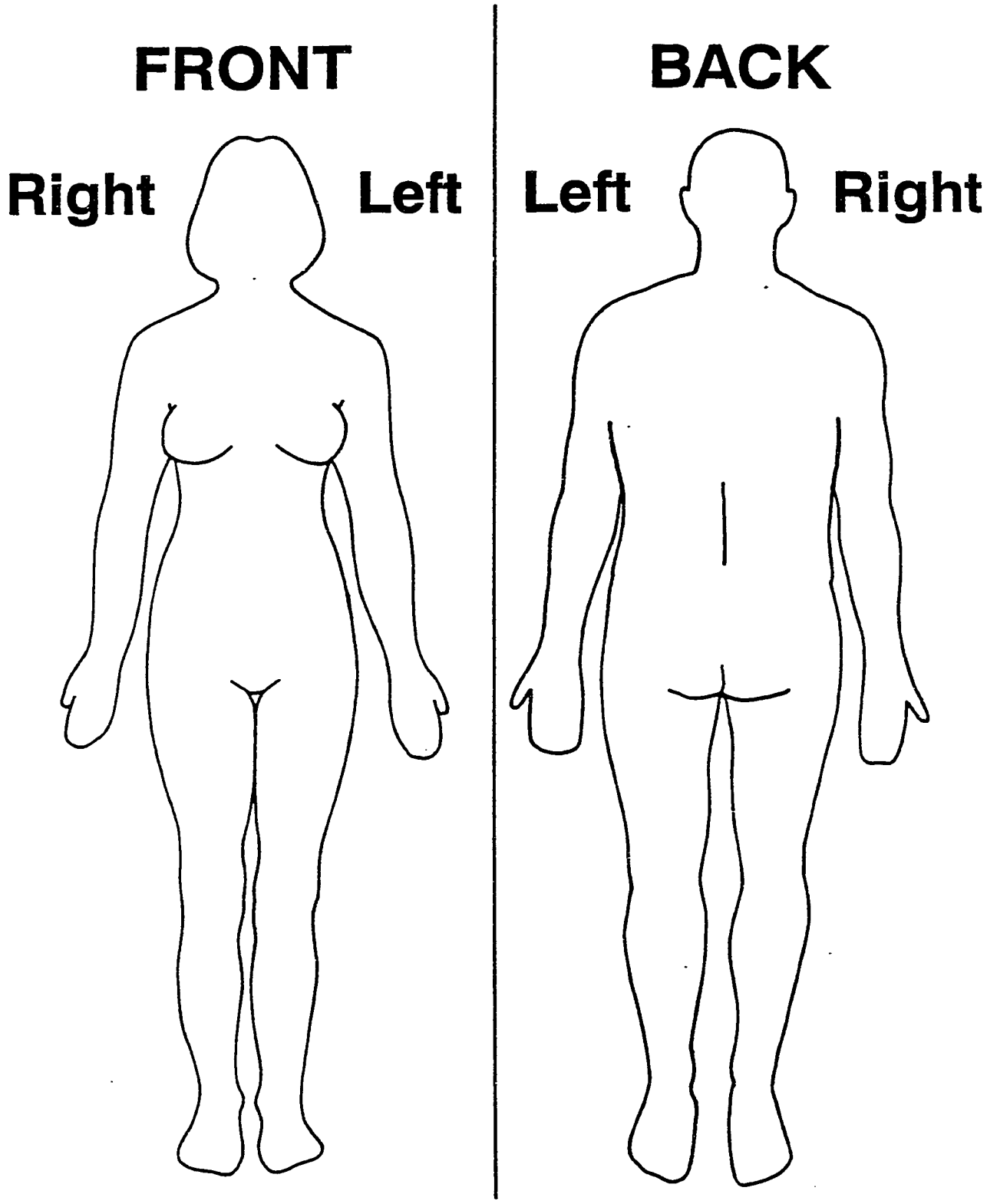
NO VISITORS

PAIN

Where does it HURT?

HEAD	THROAT
CHEST	BACK
KNEE	ARM

EXERCISE ARM LEG


FRONT
Right
Left
BACK
Left
Right

MEDICAL CONDITION

How are you FEELING?

GOOD? NOT GOOD?

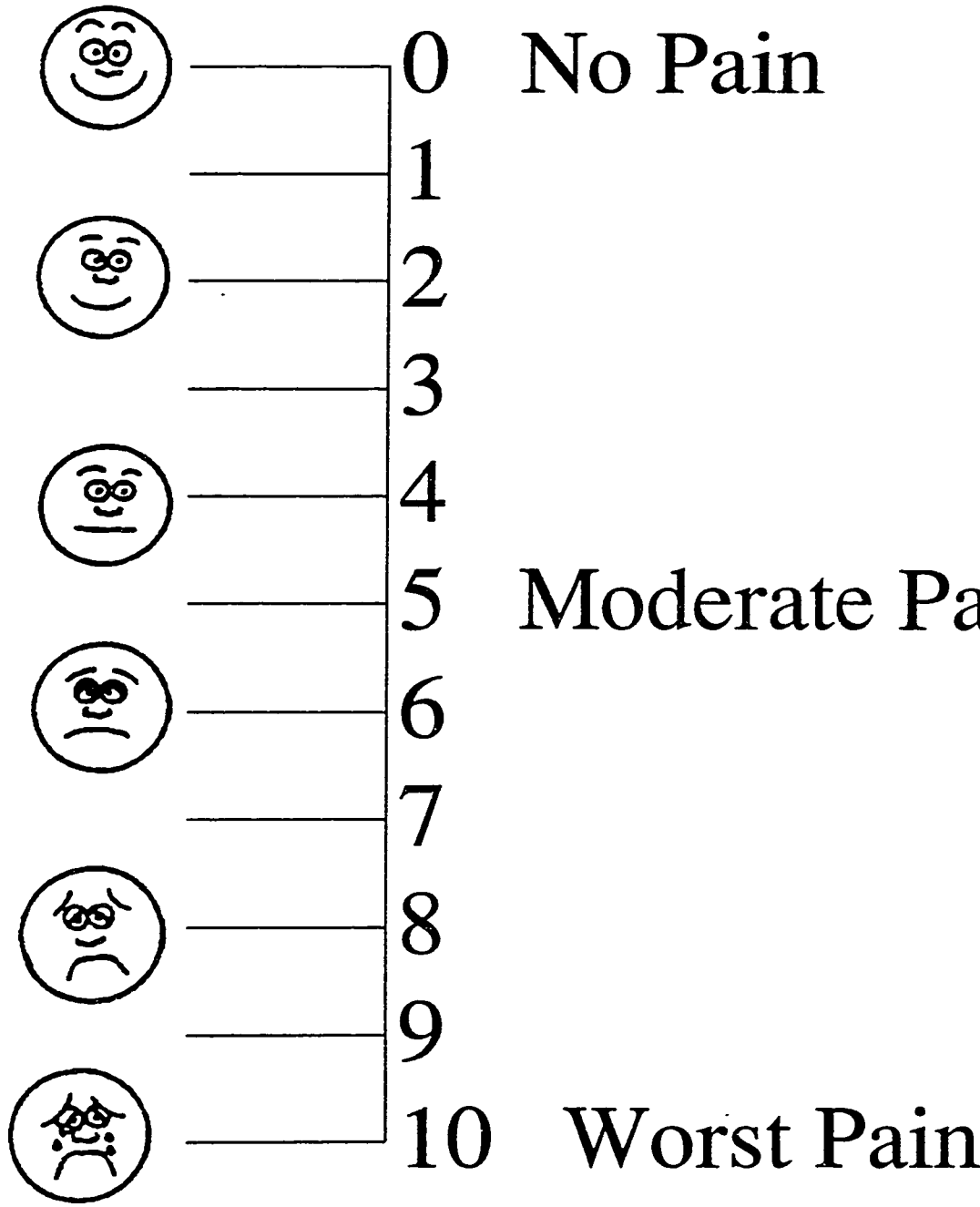
What HURTS?

Show me WHERE it hurts.

Is it your CHEST?

Is it your HEAD?

Having trouble
BREATHING?


0 No Pain
1
2
3
4
5 Moderate Pain
6
7
8
9
10 Worst Pain

WORRIES - ANXIETY

Are you WORRIED?

Do you need your FAMILY?

Do you want to know about YOUR TESTS?

You get WORRIED when:

_____

You need INFORMATION about: _____

COMFORT

DO YOU WANT TO TELL ME ABOUT...

Your DIET? FLUIDS? POSITION?

Your DOCTOR?

Your MEDICATION?

Your GLASSES?

Your HEARING AID?

Your DENTURES?

COMMUNICATION

Can you TALK? Can you HEAR?

Can you READ?

Do you SPEAK ENGLISH?

Do you need a TRANSLATOR?

What LANGUAGE do you speak? ARABIC? Other?

Can you BLINK?

Can you BLINK ONCE FOR <u>YES</u>?

Can you BLINK TWICE FOR <u>NO</u>?

CAN'T BREATHE

SUCTION ME

TUBE IN MY MOUTH IS PULLING

I NEED A TREATMENT

TAKE DEEP BREATH

TRY TO COUGH

HEAD UP
HEAD DOWN

TURN RIGHT
TURN LEFT

LEFT RIGHT

HOT COLD PAIN

SWAB MOUTH

ICE CHIPS

NEEDS

What do you NEED?

Are you HUNGRY?
THIRSTY?

Do you need to go to the BATHROOM?

Do you need a BEDPAN?

A B C D

E F G H

I J K L

M N O P

Q R S T

U V W X

Y Z

1 2 3 4 5

6 7 8 9 10

YES

NO

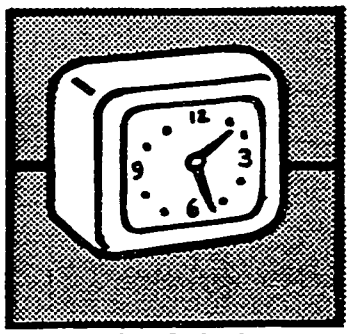
NOTES

NOTES

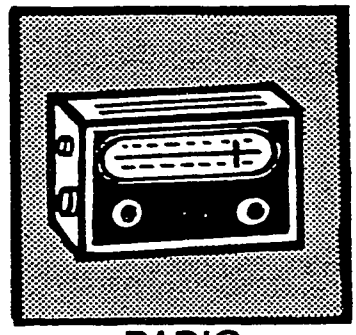
MONTH _____

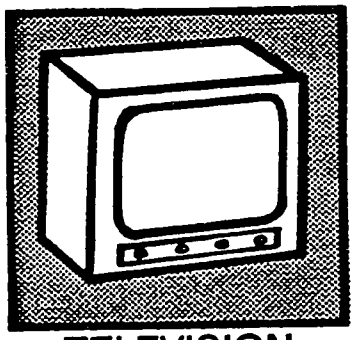
SUN	MON	TUES	WED	THRUS	FRI	SAT

MY ROOM


CLOCK


TELEPHONE

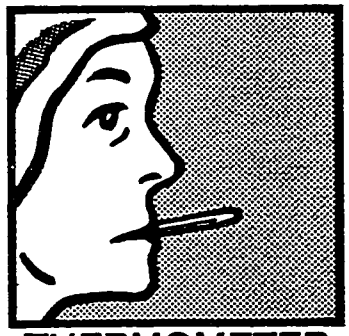

RADIO

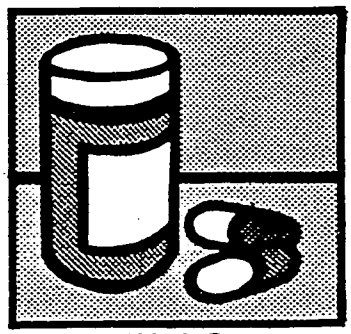

TELEVISION


NOISE


COLD


HOT


THERMOMETER

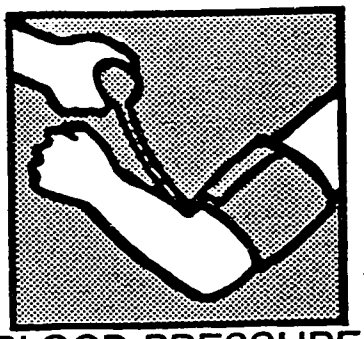

PILLS

MEDICINE/SHOT

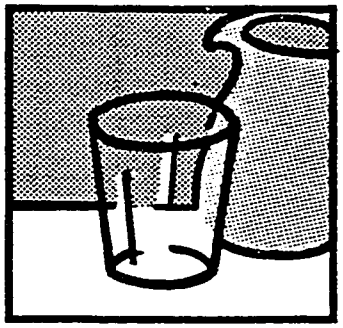
NURSE

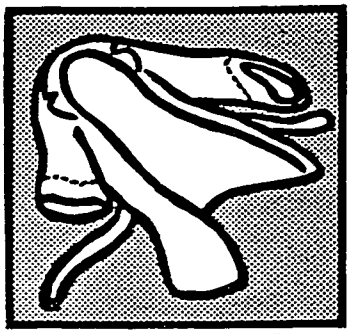
DOCTOR

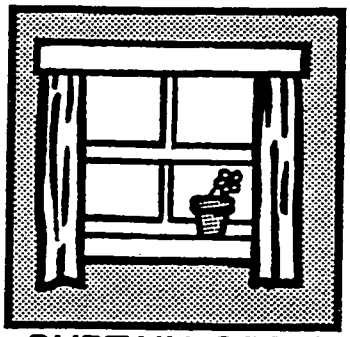
MY ROOM

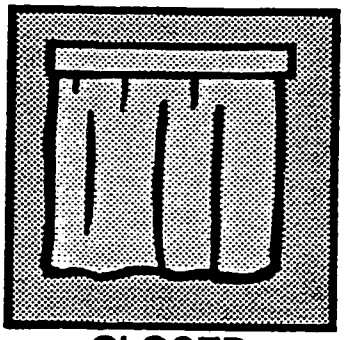

BLOOD PRESSURE

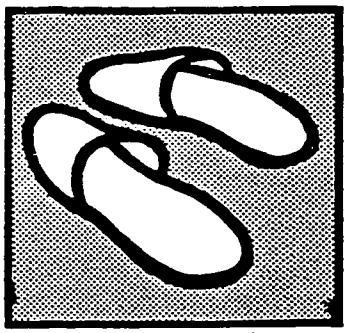

WATER

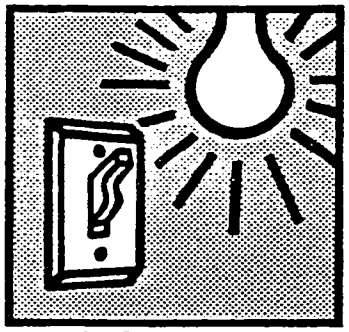

GLASS

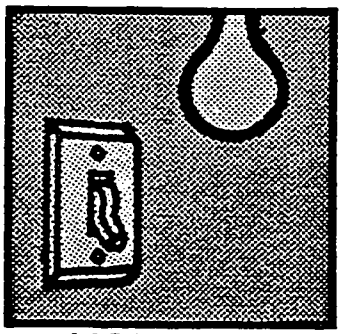

BATHROBE

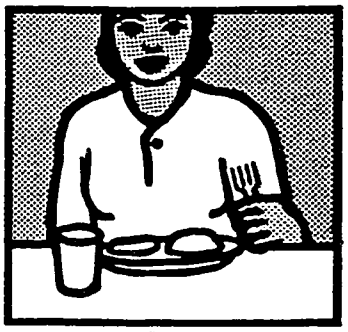

CURTAIN OPEN

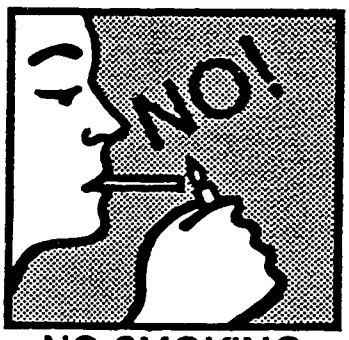

CLOSED


SLIPPERS

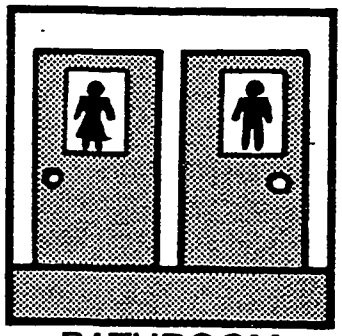

LIGHT ON


LIGHT OFF

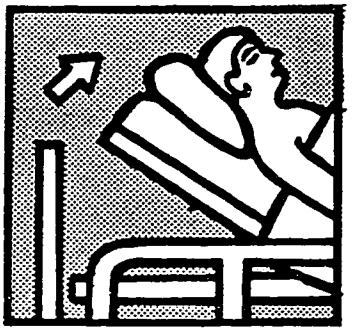

FOOD



NO SMOKING

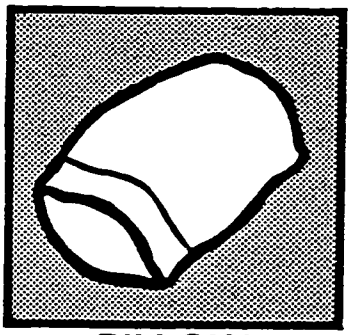

BATHROOM

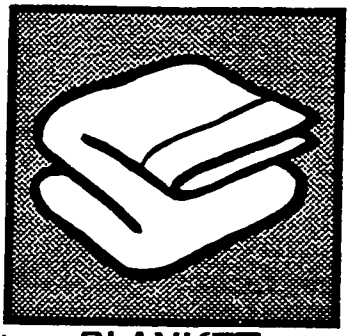
MY ROOM

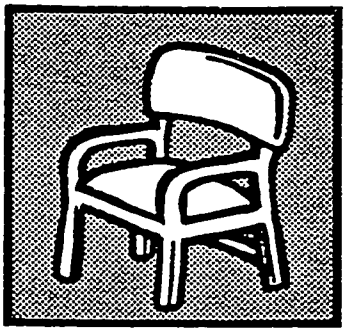

BED UP

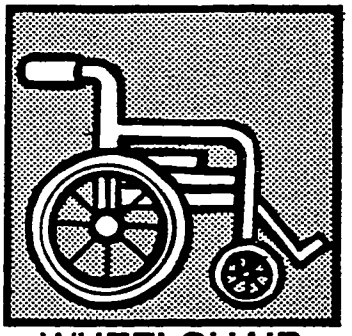

BED DOWN

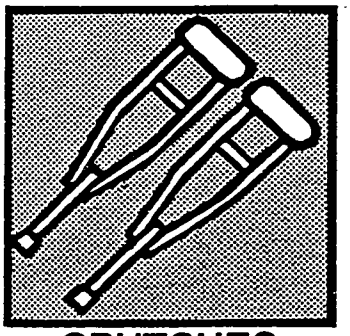

TURN OVER

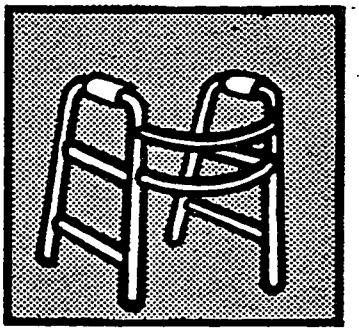

PILLOW

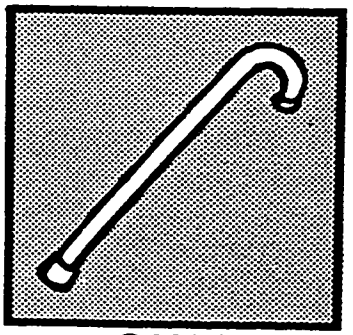

BLANKET

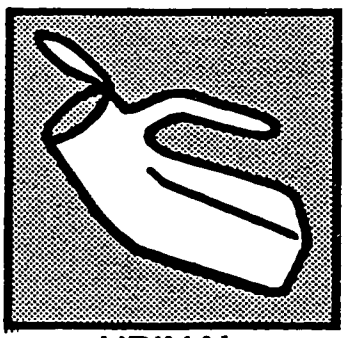

CHAIR

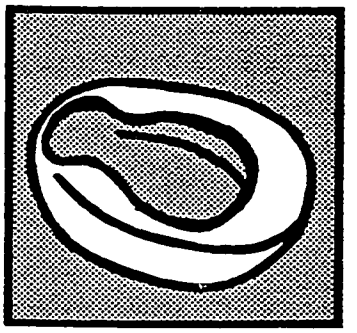

WHEELCHAIR


CRUTCHES

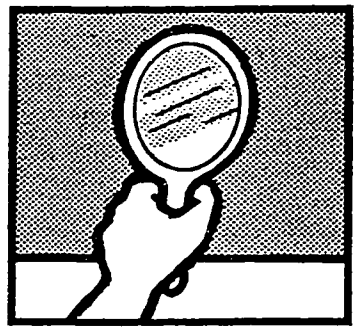

WALKER


CANE

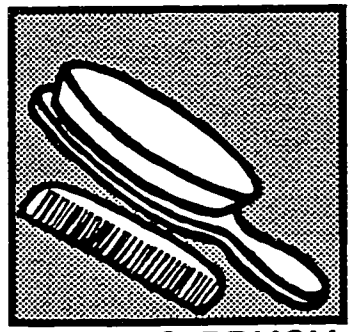

URINAL


BEDPAN

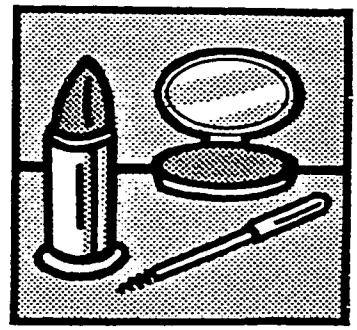
MY ROOM



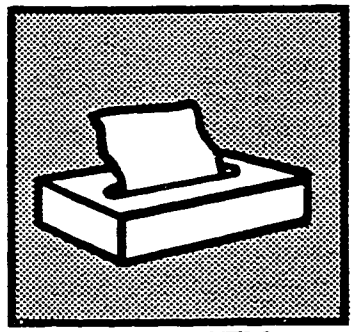
MIRROR



COMB & BRUSH

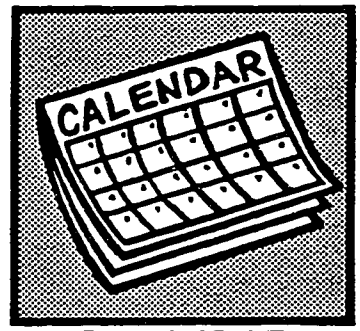


MAKE UP



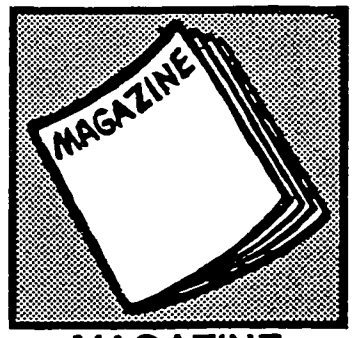
KLEENEX

WEIGHT

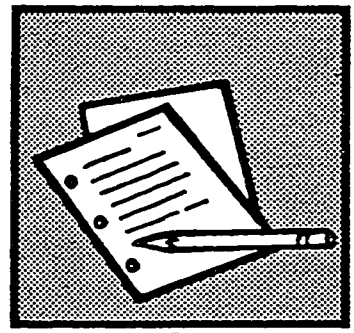


CALENDAR

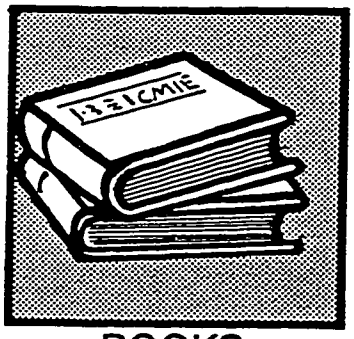
NEWSPAPER



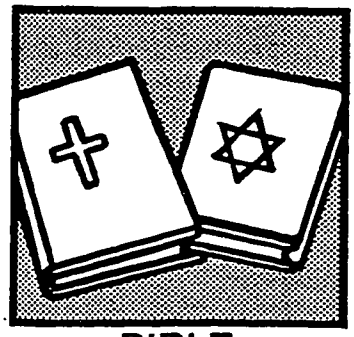
MAGAZINE



WRITING PAPER



BOOKS



BIBLE

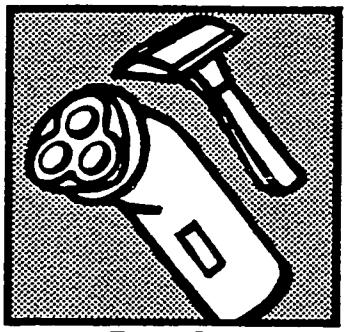
YES

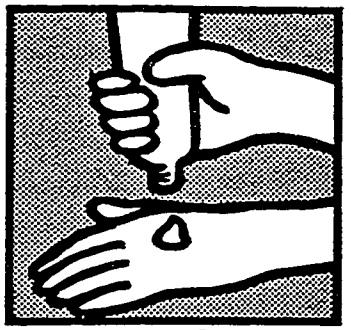
NO

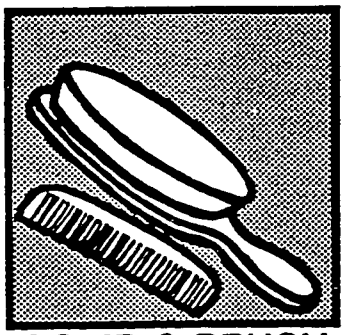
I DON'T KNOW

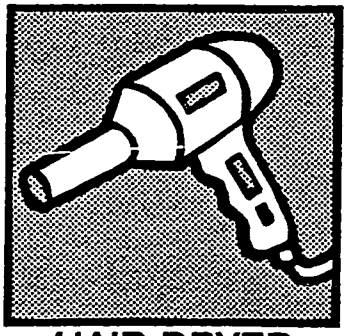
BATHROOM


TOOTHBRUSH

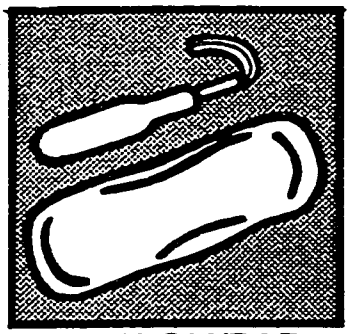

RAZOR


HAND LOTION

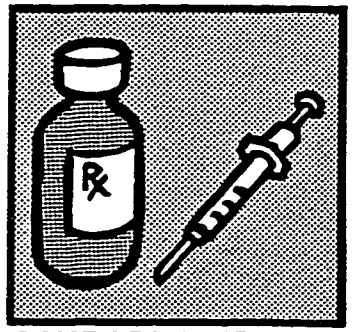

COMB & BRUSH


HAIR DRYER

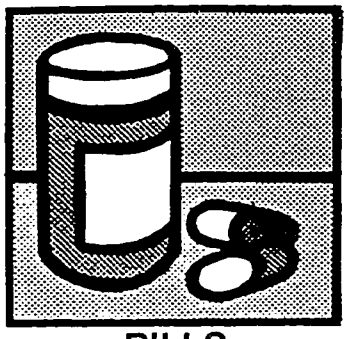

MAKE UP

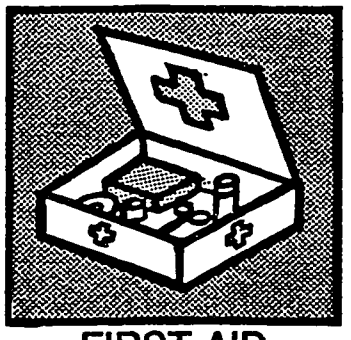

TAMPON/PAD


WEIGHT



MEDICINE/SHOT


PILLS

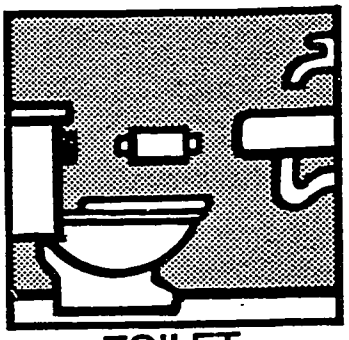

FIRST AID

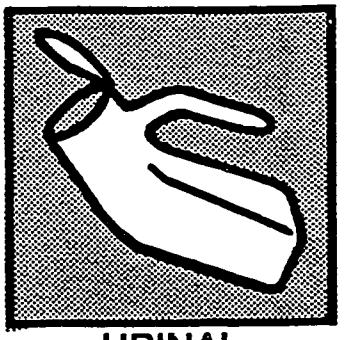
YES

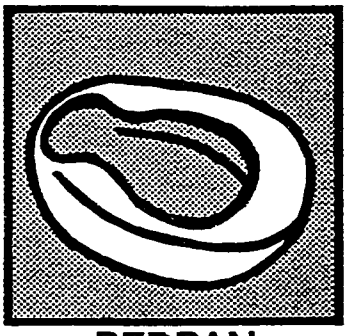
NO

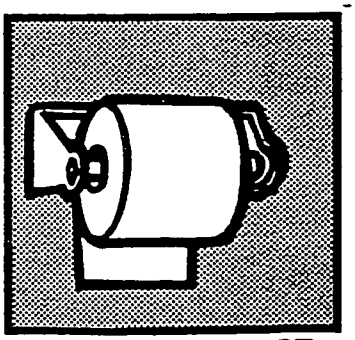
I DON'T KNOW

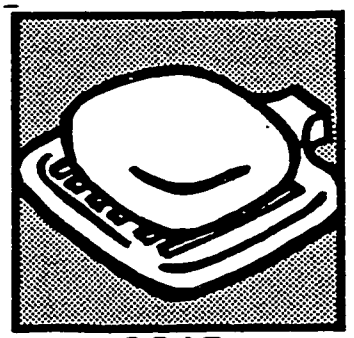
BATHROOM

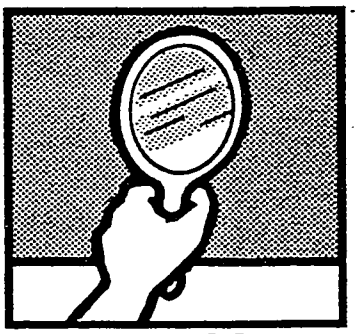

TOILET

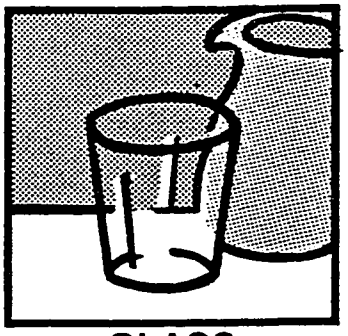

URINAL


BEDPAN


TOILET PAPER


SOAP

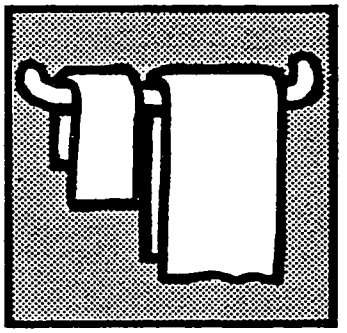

MIRROR

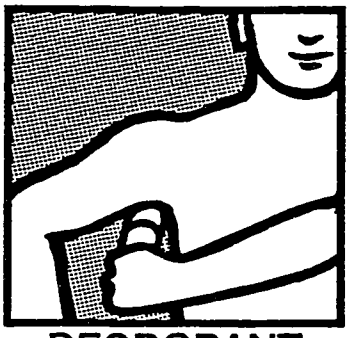

GLASS


WATER

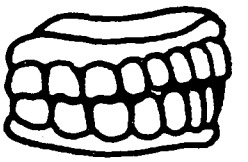
SHOWER


SHAMPOO


TOWEL


DEODORANT

GLASSES



DENTURES

APPENDIX D

FORMATIVE EVALUATION SURVEYS

WHAT WOULD YOU AND YOUR AREA LIKE TO SEE IN A COMMUNICATION/LANGUAGE TOOL?

With the passage of the American Disabilities Act, all healthcare institutions are mandated to have the capabilities to communicate with patients who have hearing or speech empairements.

Instructional Technology is in the process of developing a communication/language tool that will be used in nursing and non-nursing areas. We'd like this tool to be as effective and individualized as possible, and for that we need your input.

What would your area like to see in terms of written statements or questions, in English and/or Arabic? What types of visuals would help you, your patients and families communicate? Do you want something that can be kept on the unit, or a tool that patients keep with them?

You can help us by letting us know what you would like to see in such a tool. Thank you.

Rene Lichtman, Ed.S.
Instructional Technology

Please fill out the form below and mail to:
112 ABE, Instructional Technology, Rene Lichtman,
or call Rene at 17463.

I _____ (name) _____ (dept), would like to see the following statements and/or visuals in the Communication/Language Tool:

_____

_____

_____

_____

_____

_____

_____

_____

COMMUNICATION TOOL SURVEY
(to be completed by staff)

Educational Design (was Instructional Technology Department) would like to upgrade and improve this Communication Tool based on your specific needs. Please tell us what you think of the present content and what additions you would like to see. Return to: Rene Lichtman, 112 AB, or call 1-7463. Thank you.

Your name Position Department/area Phone/beeper

I use the laminated, spiral tool (stays on the unit) only __

I use the paper version, which I give out to patients and families ___

I use both versions, laminated (stays on unit), and paper (patients/families) ___

I can use ____ copies of laminated communication tool.

I can use ____ copies of paper tool per_____ (month, year).

I would like to see the following visuals/text (instructions, questions) added:

please turn over...

WHO ARE YOUR PATIENTS?

Please help us identify the characteristics of your patient population by filling out this table. Return to Rene Lichtman, 112 ABE, Educational Design. Thank you.

PATIENT CHARACTERISTICS Patients can:	YES	NO	SOME CAN	NOT APPLY	COMMENTS
speak					
hear					
see with glasses					
see without glasses					
move hands					
point with finger					
speak English					
Foreign language is Arabic					
If hearing impaired, can patients: speak..... read..... use American Sign Language					
IN YOUR AREA, WHO WILL USE THE COMMUNICATION TOOL MOST:					
	YES	NO			
Health care worker					
Patient					
Family					
All					
Will patients take tool to other areas of the hospital?					

c:\wp51\rene\communic.too\survey

APPENDIX E

SURVEY PACKET

Memo

To: All Staff Members

From: Rene Lichtman

Re: Preliminary Study – Beaumont Communication Tool

I am conducting a preliminary study on the use of the Beaumont Communication Tool. This study will provide information regarding the use of this tool in working with non-communicative patients.

I would like you to answer the following questions and return to:

Educational Design
Rene Lichtman
112 ABE.

I work with non-communicative patients. ☐ Yes ☐ No

I use (have used) the Beaumont Communication Tool with non-communicative patients. ☐ Yes ☐ No

I would like to ask you to participate in a research study if you are using, or have used, the Beaumont Communication Tool with patients who are unable to communicate because of accident, illness, or inability to speak English. If you are willing to complete a survey on the usage of the communication tool, please indicate your name and interdepartmental mail address below. All responses will be confidential, with no individual identifiable through the summarized results of the analysis.

Name: _____

Interdepartment Mail Address _____

Thank you for your time.

Rene Lichtman

Rene Lichtman

5258 Whispering Oak
West Bloomfield, Michigan 48322

Dear Colleague,

I am a doctoral candidate at Wayne State University. The research I am completing for my dissertation is on "The Development, Formative Evaluation, and Usage of a Health Communication Tool For Noncommunicative Patients." The purpose of this study is to examine the development of a communication tool, the methods that were used to distribute and implement the tool in the hospital, and determine how it is being used currently.

The enclosed survey should take approximately 10 to 15 minutes to complete. The necessary directions to complete each of the sections are included for your information.

All responses will be confidential and no individual will be identifiable from the analyses presented on the final report. The survey is not coded to provide to protect your confidentiality. Please do not provide any identification on the surveys.

Participation in this study is voluntary, with return of your completed survey evidence of your willingness to participate in the study. Withdrawal from the study will be possible throughout the data collection period. Following completion of this period, it will not be possible to identify your survey, preventing withdrawal from the study. No risks are likely to result from your participation in this study. In the unlikely event of an injury arising from participation, no compensation is offered by Wayne State University.

Please complete the survey within ***five working days***, place it in the enclosed sealable envelope, and return it to the researcher via inter-hospital mail.

I appreciate your help with this study. Without colleagues like yourself, a research project of this type would not be possible.

If you have any questions or would like additional information regarding this study, please feel free to contact the researcher at (248) 551-7463.

Sincerely,

Rene Lichtman

Rene Lichtman

Enclosures

BEAUMONT COMMUNICATION INSTRUMENT

I have used the Communication Tool with non-communicative patients

❑ Yes ❑ No ❑ Don't know about it.

If yes, please indicate the frequency with which you use the Communication Tool

❑ Daily ❑ Weekly ❑ Monthly ❑ Infrequently ❑ Never

I. YOUR POSITION AT BEAUMONT

What area/floor/unit do you work on? _____

What is your job category? _____

How long have you worked in health care? _____ years

How long have you worked at Beaumont? _____ years

II. PATIENT CHARACTERISTICS

Patient Population With Whom You Most Frequently Work (Check all that apply)

❑ Cardiac patients ❑ Cancer ❑ Non-native speakers of English
❑ Rehab inpatients ❑ Head injured ❑ Hearing Impaired
❑ Stroke patients ❑ Intubated patients ❑ Other _____

Patient Population Who Is Using the Communication Tool (Check all that apply)

❑ Stroke patients ❑ Hearing Impaired ❑ Non-native speakers of English
❑ Intubated patients ❑ Other _____

How often do you work with non-communicative patients?

❑ Daily ❑ Weekly ❑ Monthly ❑ Infrequently ❑ Never

III. PARTICIPATION IN THE DEVELOPMENT OF THE COMMUNICATION TOOL

Did you participate in the development of the Communication Tool? ❑ Yes ❑ No

If yes, how did you participate in the development? (Check all that apply)

❑ Completed survey in Nursing Newsletter "Partners in Excellence"
❑ Participated in telephone interview(s)
❑ Completed mailed survey
❑ Informal discussions
❑ Reviewed the Communication Tool and provided feedback
❑ Used the Communication Tool with patients, then provided feedback
❑ Other _____

IV. PERCEIVED STRENGTHS, WEAKNESSES OF COMMUNICATION TOOL

Indicate your level of agreement on each of the items in this section by using the following scale:

0	1	2	3	4	5
Have not used Tool	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Place a check mark (✓) in the column that most closely matches your level of agreement with each of the following statements.	**0**	**1**	**2**	**3**	**4**	**5**
CONTENT: *The types of information contained within the Communication Tool*						
1. Information in the Communication Tool is sufficient for my patients.						
2. Patients seem to like the content of the the Communication Tool						
3. Families seem to like the content of the Communication Tool						
4. I use the content with non-English speaking patients and families.						
FORMAT: *Physical and structural aspects of the Communication Tools*						
5. I find dimensions (size) of the tool convenient for my patients.						
6. I find the format (text followed by visuals) appropriate for my patients.						
7. The construction (size, thickness, binding) is practical for my patients.						
8. The construction of the tool (size, thickness, binding) is practical for families.						
9. I like the layout of the text on the pages.						
10. I like the layout of the visuals (drawings) on the pages.						
TEXT						
11. I find the text (sentences) of the tool useful.						
12. I find the size of the text appropriate for my patients.						
13. I find the amount of text on each page appropriate for my patients.						
14. I find the text helpful in communicating information to patients						
15. The typeface used in the Communication Tool is appropriate for my patients.						
16. There is the right amount of text on each page.						
VISUALS/DRAWINGS						
17. I find the visuals (drawings) useful in communicating information to patients.						
18. I find the size of the drawings appropriate for my patients.						
19. Patients seem comfortable using the visuals in the tool.						
20. Families seem comfortable using the visuals with patients						
21. There are the right amount of visuals on each page.						

Place a check mark (✓) in the column that most closely matches your level of agreement with each of the following statements.	0	1	2	3	4	5
USE WITH PATIENTS AND FAMILIES						
22. Families are able to use the Communication Tool independently.						
23. The Communication Tool is useful in doing my work.						
24. I use the tool often in my work with patients and families.						
25. I give the Communication Tool to all non-communicative patients.						
26. I often give the Communication Tool to families.						
27. I show patients' families how to use the Communication Tool.						
28. Patients and families find the tool helpful.						
29. Families are able to use the Communication Tool with patients.						
30. Patients are able to use the Communication Tool independently.						
31. I explain the tool when I give it to the families						
32. I need instructions on how to use the tool.						
33. Someone has explained how I should use the Communication Tool						
34. I used the Communication Tool when I first received it.						
35. I will use the Communication Tool again.						
36. I use the Communication Tool in conjunction with other types of communication tools.						

V. AVAILABILITY AND DISSEMINATION OF COMMUNICATION TOOL

Place a check mark (✓) in the column that most closely matches your level of agreement with each of the following statements.	0	1	2	3	4	5
37. The tool is available to patients						
38. The tool is available to families						
39. Most of the staff know where to find the Communication Tool						
40. I know how to reorder Communication Tools.						
41. My supervisor encourages me to use the tool.						
42. I know I can give the tool to any patient who needs it.						
43. I should only give the tool to those patients who really need it.						
44. I am comfortable giving the tool to patients and families to take home.						
45. No restrictions are placed on giving the tool to families						
46. I explain the tool when I give it to the patient						
47. I know reordering the tool will not cost my unit/department money.						

VI. REASONS WHY I USE THE COMMUNICATION TOOL

Place a check mark (✓) in the column that most closely matches your level of agreement with each of the following statements.	**0**	**1**	**2**	**3**	**4**	**5**
48. I feel the tool can be helpful.						
49. Sometimes the tool meets my needs.						
50. Sometimes the tool meets the needs of patients.						
51. Sometimes the tool meets the needs of families.						
52. I feel the Communication Tool can be effective with some patients.						
53. I feel the tool can improve communication between myself and patients.						
54. I feel the tool can improve communication between patients and families.						
55. Using the tool with patients saves me time in communication.						
56. I use the text portions of the tool.						
57. I use the visuals portion of the tool.						
58. I know I can make changes and additions to the tool to meet my needs.						

VII. REASONS WHY I DO NOT USE THE COMMUNICATION TOOL

Place a check mark (✓) in the column that most closely matches your level of agreement with each of the following statements.	**0**	**1**	**2**	**3**	**4**	**5**
59. The Communication Tool is not readily available.						
60. The tool does not meet my needs.						
61. The tool does not meet the needs of my patients.						
62. I forgot it was available.						
63. I do not have the time to explain the tool to patients.						
64. I use other techniques.						
65. I only use the tool when we have inspections.						
66. I use other tools with which I feel more comfortable.						
67. I use other tools that are simpler.						
68. I would use the tool more often if it was in the foreign language of patients.						
69. I would use the tool more often if it had other content/text/visuals.						
70. I would not use the tool even if it had additions.						

VIII. ADDITIONAL COMMENTS:

_____

_____

- Thank You -

APPENDIX F

CORRESPONDENCE

Beaumont®
William Beaumont Hospital
Royal Oak

July 20, 1997

To Whom it May Concern:

Pending approval of William Beaumont Hospital's HIC and IRB Committees, the hospital will allow the researcher, Rene Lichtman, to distribute his Survey Packet, including the survey instrument, the cover letter and a return self-addressed envelope, to selected staff, both nursing and non-nursing.

The researcher will not, under any circumstances, have any contacts with patients or family members.

The researcher is authorized by William Beaumont Hospital to use the booklet "Communication Tool" in his Ph.D. research at William Beaumont Hospital. It is understood that Mr. Lichtman will not profit financially from the usage of the Communication Tool.

Barbara Kotal
Barbara Kotal, MSN, RN,C
Director
Nursing Development and Educational Resources
William Beaumont Hospital, Royal Oak

Wayne State University
Human Investigation Committee

Behavioral Institutional Review Board
University Health Center, 8C
4201 St. Antoine Blvd.
Detroit, MI 48201
(313) 577-1628 Office
(313) 993-7122 Fax

Notice of Protocol Exempt Approval

TO: Rene Lichtman, Education
(Instructional Technology)
5258 Whispering Oak
West Bloomfield, MI 48322

FROM: Peter A. Lichtenberg, Ph.D. Peter A. Lichtenberg Ph.D
Chairman, Behavioral Institutional Review Board

SUBJECT: Exemption Status of Protocol # B 07-02-97(B03)-X; "The Development, Formative Evaluation, and Usage of a Health Communication Tool for Noncommunicative Patients"

SOURCE OF FUNDING: No Funding Requested

DATE: July 18, 1997

==========

The research protocol named above has been reviewed and found to qualify for exemption according to paragraph #2 of the Rules and Regulations of the Department of Health and Human Services, CFR Part 46.101(b).

Since I have not evaluated this proposal for scientific merit except to weigh the risk to the human subjects in relation to potential benefits, this approval does not replace or serve in the place of any departmental or other approvals which may be required.

Cc: J. Moseley/1203 Scott Hall

Beaumont

William Beaumont Hospital
Royal Oak

Human Investigation Committee
Richard L. Lucarotti, Pharm.D.
Chairman

October 3, 1997

Rene Lichtman
Department of Education Design
William Beaumont Hospital
Royal Oak, Michigan 48073

RE: Project entitled:

THE DEVELOPMENT, FORMATIVE EVALUATION, AND USAGE OF A HEALTH COMMUNICATION TOOL FOR NONCOMMUNICATIVE PATIENTS

I have reviewed the above referenced research proposal that you submitted for consideration by the Human Investigation Committee. I believe that your project is exempt under paragraph one of the DHHS Federal Register [45 CFR 46.101(b) (4)], which lists exemption categories.

Note: This exemption status is approved for a two year period. You must reapply for exemption status at the end of this period and at any time a change to this study is made.

Sincerely,

Richard L. Lucarotti

Richard L. Lucarotti, Pharm.D.
Chairman
Human Investigation Committee

/bdc-ProExem

WILLIAM BEAUMONT HOSPITAL
ROYAL OAK, MICHIGAN
Nursing Development and Educational Resources

RESEARCH ADVISORY COMMITTEE
RECOMMENDATION REGARDING PROPOSED STUDY

Investigator: Rene Lichtman

Title of Study: The Development, Formative Evaluation and usage of a Health Communication Tool for NonCommunicative Patients

Recommendation

__X__ Approved for conduct

_____ Not approved for conduct

_____ Resubmit with the following changes:

Comments (including any special requirements that must be fulfilled by the investigator)

Barbara Kotal
Name of Director

Barbara Kotal
Signature

10-21-97
Date

Research.rec

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Abstract

THE DEVELOPMENT, FORMATIVE EVALUATION, DIFFUSION, AND USAGE OF A HEALTH COMMUNICATION TOOL FOR NONCOMMUNICATIVE PATIENTS

by

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May, 1999

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Major: Instructional Technology

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The purpose of this study was to examine the usage (diffusion) of the Beaumont Communication Tool, as part of a formative evaluation, to determine who is using the communication tool, perceptions of strengths and weaknesses of the communication tool, and perceptions of the effectiveness of the communication tool in facilitating communications with nonverbal patients.

A total of 90 nurses and ancillary professionals, who used the communication tool completed an original survey to determine strengths and weaknesses of the tool, use with patients and families, and reasons why the tool is used or not used in their areas. The staff members provided their professional characteristics and characteristics of their noncommunicative patients.

The responses from participants indicated a lack of use of the communication tool on a regular basis. The results indicated that professional characteristics and patient characteristics were not predictors of either the use or nonuse of the communication tool. Visuals, text and graphics, as well as perceived effectiveness of the tool with patients and

families were found to be predictors of the use of the communication tool.

The communication tool was developed for use with noncommunicative patients following the systems approach in Instructional Technology. The lack of use may have been due to a lack of training in appropriate use of the communication tool. Nurses and other professional ancillary staff members may also have not had sufficient time with each patient to use the tool effectively. Further research and evaluation are needed to determine how the tool can be designed with greater input from the staff who will be using it, so that a greater number of staff are aware that the tool exists and are familiar with ways of using it. At the same time, further evaluation may determine how an educational tool can be distributed to staff members in a large organization, may contribute to the diffusion process, and determine use with patients who are noncommunicative. It may no longer be enough for a designer to create an effective educational product; the end steps in the systems design approach must be reexamined and emphasized in the process.

AUTOBIOGRAPHICAL STATEMENT

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EDUCATION

Doctor of Philosophy, Instructional Technology
Wayne State University, Detroit, Michigan, 1999

Education Specialist Certificate, Instructional Technology, 1987
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Master of Arts Degree, Mass Communication, 1985
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PROFESSIONAL EXPERIENCE

1987- present	Instructional Designer, William Beaumont Hospital, Royal Oak
1985 - 1987	Detroit Department of Transportation: Training Coordinator
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PROFESSIONAL MEMBERSHIPS

Association for Educational and Communication Technologies
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PRESENTATIONS

"Developing Effective Patient Educational Materials," at conference "Patient Education for the Year 2000." 1998
"Presenting to Small and Large Groups" - Beaumont Hospital, 1996, 1997
"Visualizing Your Visuals" - Beaumont Hospital, 1994, 1995

AWARDS

Apollo Award of Recognition - Audiovisual Presentation, 1995,
Michigan Health Care Communicators Association, for the video "When the Joint Commission Visits You..."

Best Patient Education Print product "Diabetes - what you need to know,"
Signa Theta Tau 1989 Convention, Indianapolis, Indiana

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